ENGINEERING NEWS-RECORD

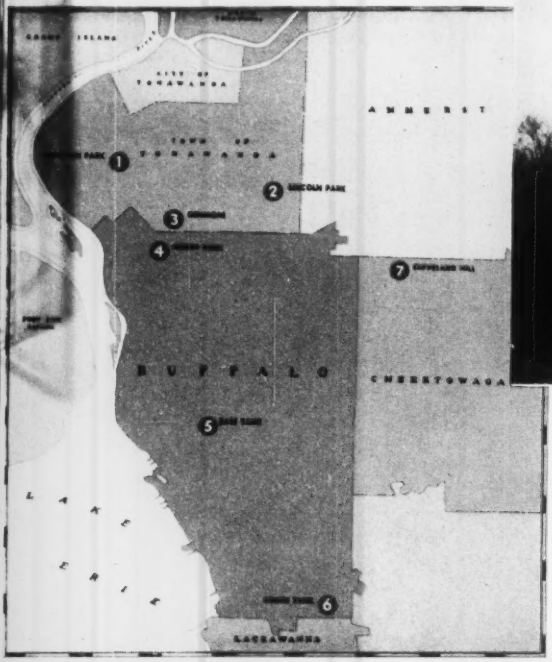
A McGRAW-HILL PUBLICATION

7 LARGE CAPACITY HORTON TANKS SERVE METROPOLITAN BUFFALO

For better daily water service throughout an area of over 70 sq. mi., Metropolitan Buffalo relies on seven large-capacity Horton tanks—10,000,000 gallons of elevated water storage. The results have been—higher water pressure—lower pressure variations—complete dependability—and above all, customer satisfaction.

Pictured on the right is one of the twin 1,000,000-gallon radial-cone bottom tanks recently installed in the Town of Tonawanda. Its modern welded steel construction assures less costly maintenance and longer life.

Horton elevated water tanks with radial-cone bottoms are built in standard capacities from 500,000 to 3,000,000 gallons. If you're planning new or increased water storage facilities—write our nearest office for details and estimating prices.



(1) 1,000,000-gal. Horton tank built in Tonawanda in 1950.
(2) 1,000,000-gal. Horton tank built in Tonawanda in 1950.
(3) 1,000,000-gal. Horton tank built in Kenmore in 1927.
(4) 2,000,000-gal. Horton tank built in Buffalo in 1937.
(5) 2,000,000-gal. Horton tank built in Buffalo in 1936.
(6) 2,000,000-gal. Horton tank built in Buffalo in 1936.
(7) 1,000,000-gal. Horton tank built in Cheektowaga in 1926.

CHICAGO BRIDGE & IRON COMPANY

13 PAY YARDS PER TRIP . . .
13 TRIPS PER HOUR . . .
6300 YARDS PER DAY

That's LPC MOTOR SCRAPER PRODUCTION *on California dirt moving job!*

ASK Ernie Wright, General Superintendent for Pacific Contracting Corp. of Long Beach, Calif. about Motor Scraper performance. Ernie says, "We have five TS-300's . . . four working while one is being serviced . . . leveling typical California sandy loam, loose and dry. With no definite haul roads, each Motor Scraper averages 13 trips per hour, 13 yards per trip, on one-way hauls ranging up to 1300 ft. High horsepower-to-yardage ratio gives the Motor Scraper the quick get-away ability that saves time on every cycle."

Power is just one of the many Motor Scraper features that assure superior earthmoving performance. Ask your LPC distributor to explain why Motor Scrapers are first choice on so many jobs. LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa — LaPlant-Choate Sales and Service, 1022 77th Ave., Oakland, Calif.

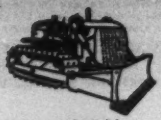
BE SURE TO CHECK THE PROFIT POTENTIAL OF THE TS-200 MOTOR SCRAPER

The powerful, agile, hydraulically controlled TS-200 is a 9- to 12-yd. earthmover, ideal for small yardage jobs, yet with all the capacity and speed necessary for big production on long haul jobs. Your nearest LaPlant-Choate distributor will be glad to give you details.

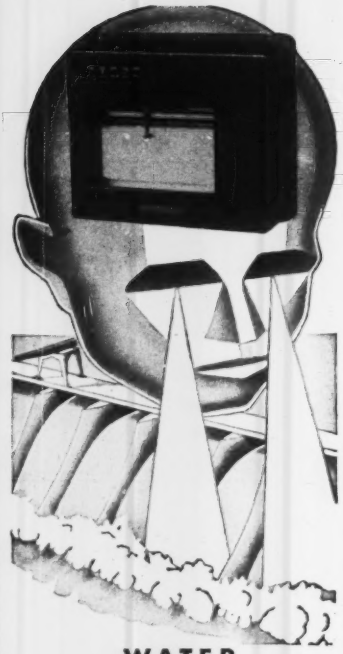
LAPLANT CHOATE

Cable-operated Scrapers in 6-, 8- and 14-yd. sizes for all makes of track-type tractors.

2- and 4-yd. Scrapers for track-type and rubber-tired industrial tractors.



Hydraulic and Cable-operated Dozers.



WATER
MEASUREMENT
OR CONTROL

STEVENS

GRAPHIC, VISUAL OR
AUDIBLE REGISTRATION

Whether you need a simple staff gage, float gage or complex remote operated recorder, there is a STEVENS instrument to meet your requirements. Water level or flow recorders for weekly service or long periods of unattended operation, direct float operated or remotely controlled; indicators, controls for alarms and pumps... the STEVENS line is complete in the field of water measurement and control. We also welcome inquiries concerning special problems.

Pioneers in the field of water level recording for more than 43 years, LEUPOLD AND STEVENS INSTRUMENTS, INC., have developed and perfected precision water measuring instruments of all types to meet a variety of specific needs, especially for water works, sewerage, irrigation and industrial uses.

Write for literature and information on accurate and dependable STEVENS water measuring instruments.

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ENGINEERING NEWS-RECORD

Member

Volume 146 — MAY 3, 1951 — No. 18

WALDO G. BOWMAN
Editor

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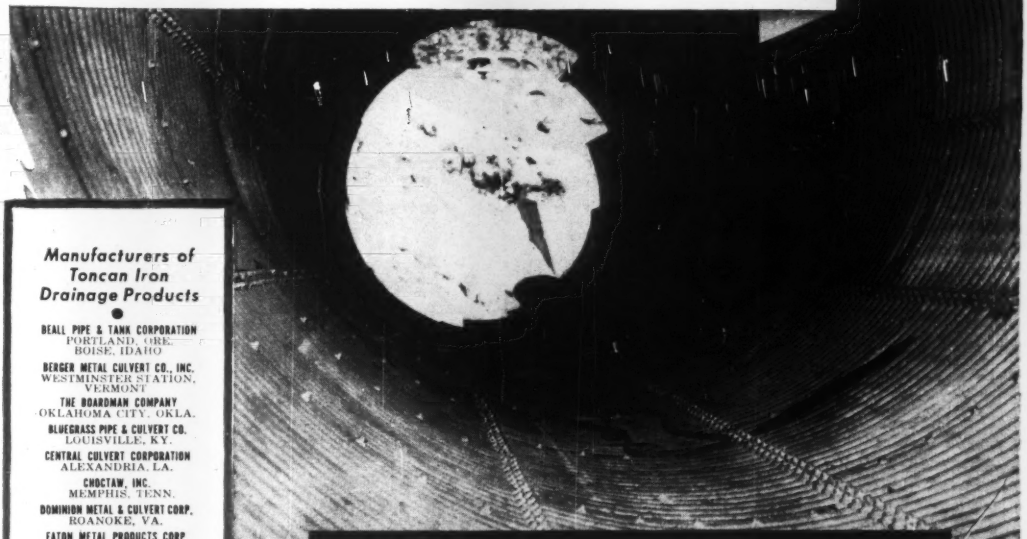
TONCAN IRON®

SECTIONAL PLATE PIPE



Manufacturers of Toncan Iron Drainage Products

BEALL PIPE & TANK CORPORATION
PORTLAND, ORE.
BOISE, IDAHO

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WESTMINSTER STATION, VERMONT

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BLUEGRASS PIPE & CULVERT CO.
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MEMPHIS, TENN.

DOMINION METAL & CULVERT CORP.
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EATON METAL PRODUCTS CORP.
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MADISON, WIS.

WYATT METAL & BOILER WORKS
DALLAS, TEX.
HOUSTON, TEX.

Speeds Up Big Jobs—Like This!

Big? This job required two 180-inch diameter pipes, 270 feet long, under 35 feet of fill. Just the kind of job where the easy-to-handle and easy-to-erect features of Toncan Iron Sectional Plate Pipe show to best advantage.

Note these features: Shipped knocked-down . . . plates and bolts arrive in one lot and all at one time. Light in weight . . . easy to handle, haul and erect . . . in any weather . . . with unskilled labor. Strong and flexible . . . will not crack or crumble in handling or in use. Resists rust . . . because Toncan Iron is an *ALLOYED IRON* containing twice the copper of copper-bearing steels and irons *plus* the proper amount of molybdenum to make the copper most effective. And salvage value is high.

See your nearest Toncan Iron Manufacturer—or write us

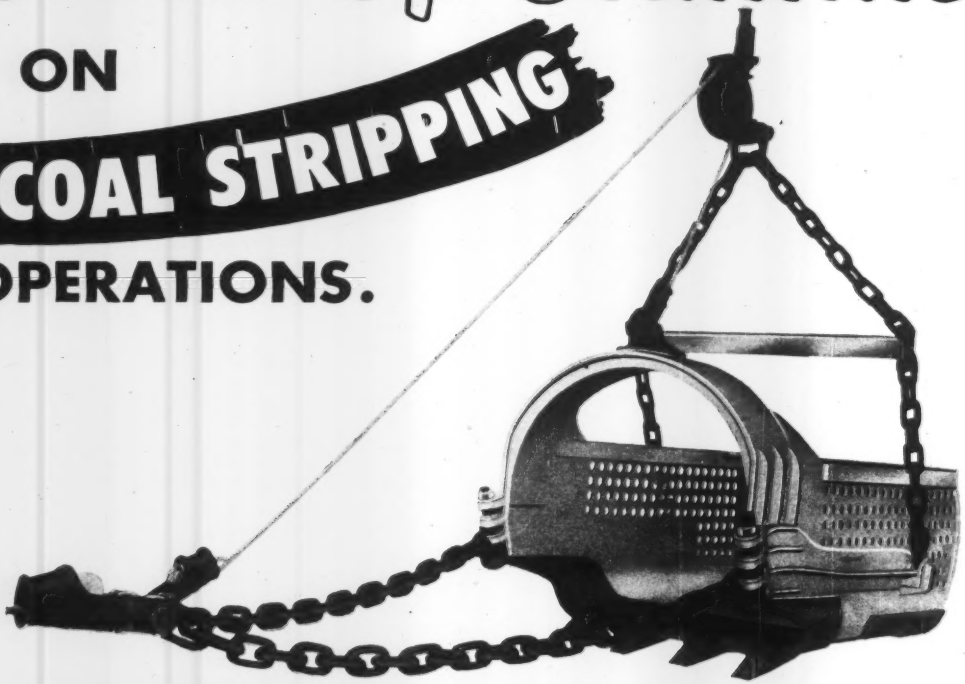
REPUBLIC STEEL CORPORATION • GENERAL OFFICES: CLEVELAND 1, OHIO

Call the Toncan Iron Man —that's your best drainage plan

Toncan Copper Molybdenum Iron Drainage Products include:
Corrugated Metal Pipe • Perforated Corrugated Metal Pipe • Sectional Plate Pipe
Sectional Plate Arches • Corrugated Metal Arch-Pipe • Sectional Plate Arch-Pipe
Corwel Subdrainage Pipe • Bituminous Coated and Paved Pipe

Stand-Up Stamina

ON COAL STRIPPING OPERATIONS.



with HENDRIX "HS" heavy duty buckets!

Wherever there's overburden to be moved . . . whereve. there's need for *extra* performance, *extra* stamina, *extra* dependability . . . there you'll find a job that's made-to-order for a HENDRIX "HS" Heavy Duty BUCKET. The "HS" is armored with cast manganese steel runners and wearing plates and is equipped with renewable manganese steel shoes for runners and plates. Those parts which wear the most *can be replaced right on the job* . . . saving time and resulting in more profits.

COMPARE THESE FEATURES

- ★ *20% to 40% lighter than other buckets, type for type.*
- ★ *All welded construction for greater strength and durability.*
- ★ *Manganese steel chains, fittings, and reversible tooth points.*
- ★ *14% cast manganese steel lips with tooth bases cast integrally.*
- ★ *Failure-proof arch of rugged box-section construction*
- ★ *¾ to 40 cubic yards. With or without perforations.*

★ *Parts shown in color are of Cast Manganese Steel.*

HENDRIX *Lightweight* **DRAGLINE BUCKETS**

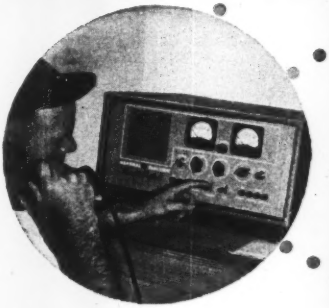
HENDRIX MANUFACTURING CO., INC.

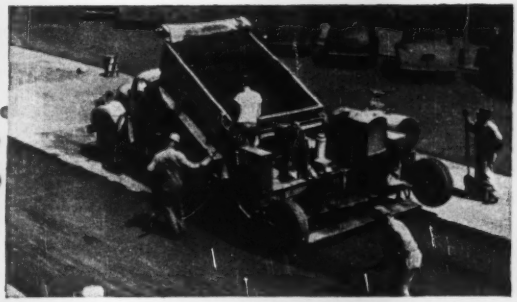
MANSFIELD — LOUISIANA

How to control 10 jobs at once

AND MAKE MONEY!

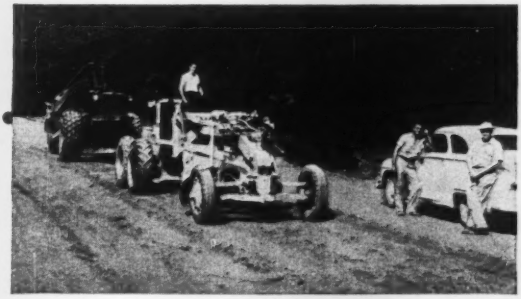
2-WAY RADIO





Radio control saves $600-$700 an hour. When paver breaks down, radio message shuts off bituminous plant miles away, saves fuel oil, heating time, labor and mileage.

Job superintendent in the field calls headquarters 20 miles away. Via radio he can talk to foremen on other jobs in construction company work area.



Road grader, down for repairs, gets fast help from radio call to dispatcher describing trouble and requesting parts.

"Radio control saves us money every day we work," says Lee Blades of the Blades Construction Company, Hornell, New York. "We do road oiling, contractual work on bridges and highways, and operate a bituminous plant. Our jobs fan out in a 100-mile radius from headquarters, with crews and equipment spread over six counties."

Cut communication delay and you cut costs—in materials, in production, in manpower. In wide area operations, you need tight control. Why not talk it over with our G-E engineers—at no obligation? To get action, mail the coupon today.

CIVIL DEFENSE—For plant protection and community service, tie into your city's 2-way radio emergency network at little cost. Ask the General Electric Electronics Department office near you for full details.

You can put your confidence in—

GENERAL ELECTRIC

Mail coupon now!

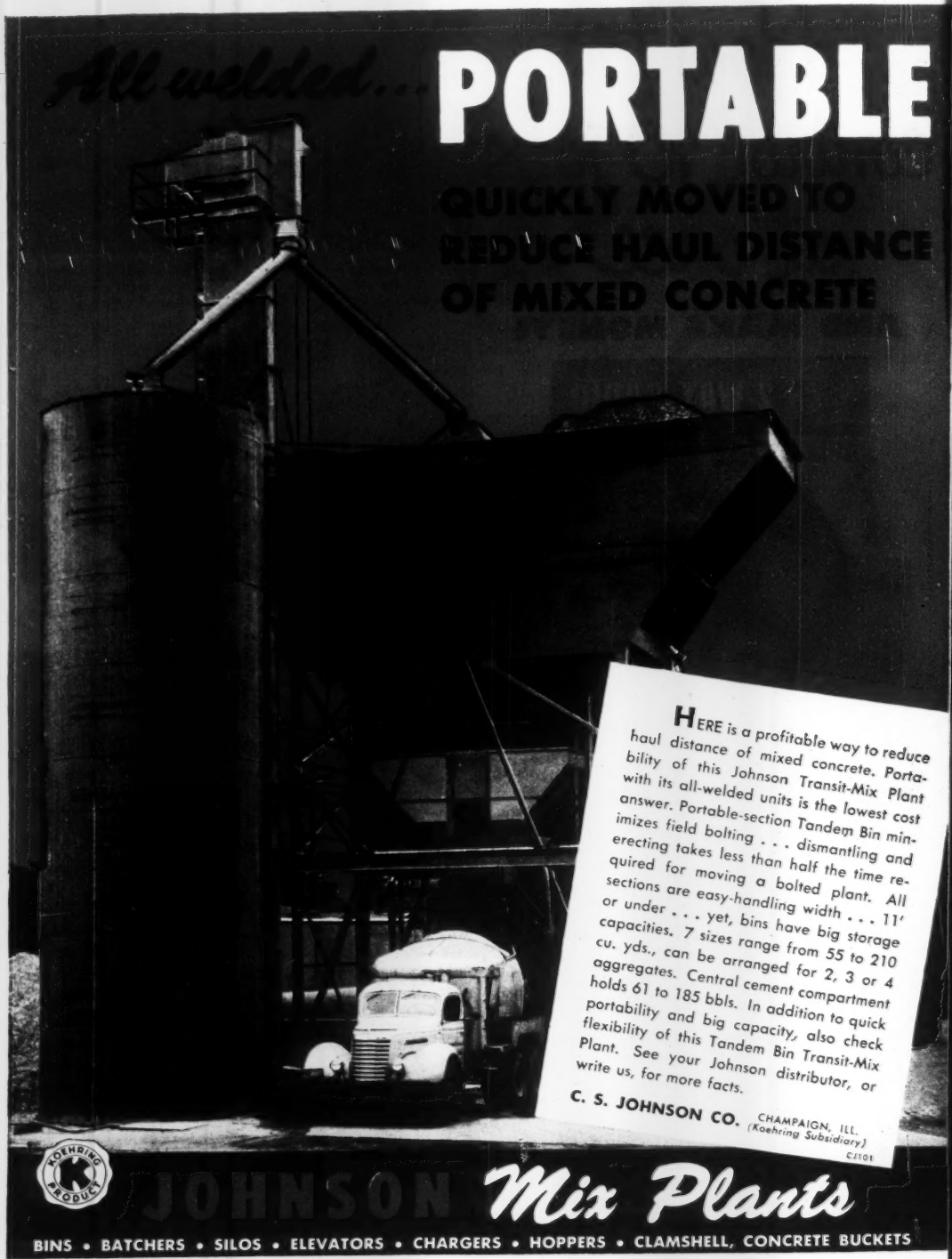
General Electric Company
Section 2251-3
Electronics Park, Syracuse, N. Y.

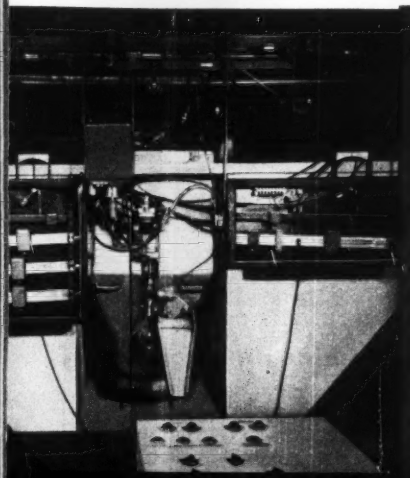
Please send me FREE INFORMATION KIT on General Electric 2-way radio communication equipment.

NAME.....

ADDRESS.....

CITY.....STATE.....

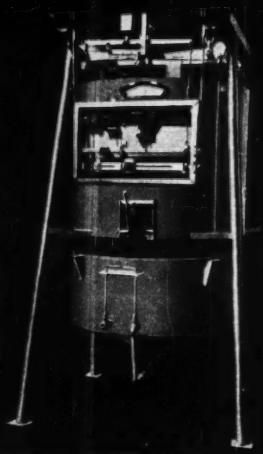

All welded...
PORTABLE
QUICKLY MOVED TO REDUCE HAUL DISTANCE OF MIXED CONCRETE
HERE is a profitable way to reduce haul distance of mixed concrete. Portability of this Johnson Transit-Mix Plant with its all-welded units is the lowest cost answer. Portable-section Tandem Bin minimizes field bolting . . . dismantling and erecting takes less than half the time required for moving a bolted plant. All sections are easy-handling width . . . 11' or under . . . yet, bins have big storage capacities. 7 sizes range from 55 to 210 cu. yds., can be arranged for 2, 3 or 4 aggregates. Central cement compartment holds 61 to 185 bbls. In addition to quick portability and big capacity, also check flexibility of this Tandem Bin Transit-Mix Plant. See your Johnson distributor, or write us, for more facts.
C. S. JOHNSON CO. CHAMPAIGN, ILL. (Koehring Subsidiary)
C2101
KOEHRING PRODUCT
JOHNSON Mix Plants
BINS • BATCHERS • SILOS • ELEVATORS • CHARGERS • HOPPERS • CLAMSHELL, CONCRETE BUCKETS



Automatic, air ram operated

CONCENTRIC BATCHER

This exclusive Johnson Concentric Aggregate-Cement Batcher, with central cement feed is fully automatic, air ram operated. Finger-tip panel (shown in foreground) controls air rams on aggregate and cement fill valves and discharge . . . assures extreme accuracy at top batching speeds for most efficient use of materials. Batcher also can be furnished with manual controls. Aggregates arranged concentrically around cement prevents "gunning". Cement is weighed on separate scale; aggregates are weighed on individual beam scales . . . or on accumulative dial scale.



WATER BATCHER

improves concrete quality

Here's another handy auxiliary unit that can help increase your mix plant efficiency — Johnson Water Weigh-Batcher. Capacities: 120 gallons or 1,000 lbs. for batches up to 2 yards . . . and 240 gallons or 2,000 lbs. for batches up to 5 yards. Semi- and full-automatic types. They're fast-weighing . . . batching accuracy is not affected by changes in water temperatures.

With 30 digging feeds, this 221 Trenchliner excavates 2½ to 3 cu. yds. per min., depending on soils, depth and width of trench. It digs 16 to 36" wide, 8'-6" deep . . . cuts within 10" of side obstructions. Spoil conveyor shifts through machine in less than 1 min., dumps on either side. Arc of conveyor provides 6'-4" clearance for loading trucks. Discharge height is constant at any boom depth. 4 other sizes. See your distributor now.

PARSONS *(Koehring Subsidiary)*
Newton, Iowa

Moto-Bug has *full-power* forward *and reverse* . . . for traveling 1½ to 4 m.p.h. in either direction, for backing up, for spotting. Operator takes it easy, rides on rear step, has positive steering wheel for fast, easy maneuvering. *Standard-make,* 4 h.p. gasoline engine takes full load up 20% ramp. Big hopper holds 10 cu. ft. . . . interchanges with 1200-lb. capacity flatbed, fork lift, scraper blade. Send for catalog now.

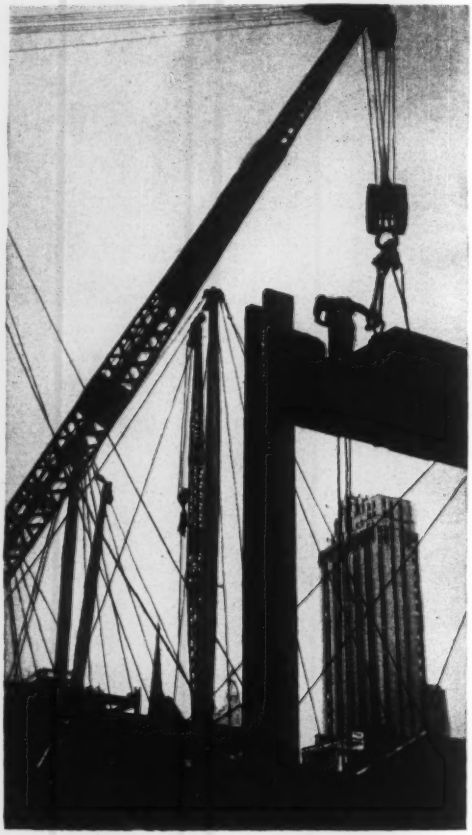
KWIK-MIX *(Koehring Subsidiary)*
Port Washington, Wis.

This mountain-side job shows typical Dumptor no-turn shuttle advantage. No need to turn on narrow ledge . . . 6-yd. Dumptor spots close to the Koehring 1½-yd. 605 . . . gets its load, drives off to fill with body forward . . . dumps, returns to shovel with body in same position. No turns necessary . . . constant-mesh transmission provides same travel speeds forward and reverse. Eliminating only two turns saves 30 seconds every cycle.

KOEHRING COMPANY
Milwaukee 16, Wis.

W66

WIRE ROPE



Roebling rope is a big help in the drive for lower costs

FOR EASY HANDLING, extra toughness and service life, there's nothing like Roebling Preformed "Blue Center" Steel Wire Rope. "Blue Center" steel—made only by Roebling—gives rope top resistance to abrasion and fatigue. And Roebling Preforming gives you a rope that spools better... doesn't tend to set or kink... minimizes vibration and whipping.

There is a Roebling wire rope of the right construction, grade and size for every type and make of rope-rigged equipment. Have your Roebling Field man help choose the rope that will give you the best and the lowest-cost performance. Still further savings may be effected by following his suggestions about the proper installation, use and maintenance of wire rope. John A. Roebling's Sons Company, Trenton 2, New Jersey.

ROEBLING

Atlanta, 934 Avon Ave ★ ***Boston,*** 51 Sleeper St ★ ***Chicago,*** 5525 W. Roosevelt Rd ★ ***Cincinnati,*** 3253 Fredonia Ave ★ ***Cleveland,*** 701 St. Clair Ave, N.E. ★ ***Denver,*** 4801 Jackson St ★ ***Detroit,*** 915 Fisher Building ★ ***Houston,*** 6216 Navigation Blvd ★ ***Los Angeles,*** 216 S. Alameda St ★ ***New York,*** 19 Rector St ★ ***Odessa, Texas,*** 1920 E. 2nd St ★ ***Philadelphia,*** 230 Vine St ★ ***San Francisco,*** 1740 17th St ★ ***Seattle,*** 900 1st Ave, S. ★ ***Tulsa,*** 321 N. Cheyenne St ★ Export Sales Office, ***Trenton, N. J.***

Sgt. Robert Chrisman levels a field at the eastern end of the Davison airstrip, Ft. Belvoir, Va., with a "Cat" D7 Tractor. In the background are four "Cat" No. 12 Motor Graders completing runway.

THE MILITARY GETS FIRST CALL

THESE "Caterpillar" earthmoving machines, working on the runway of the Davison airstrip at Ft. Belvoir, Va., show at a glance where a lot of "Cat" equipment is going these days. And that's how it's got to be.

Defense Rated Orders get first call as America's military establishment prepares for what may come. The urgent build-up of our power has meant drafting machines as well as men. An ever-increasing flow of "Caterpillar" equipment and parts is going to the support of America's fighting men and to defense projects.

This means that there already exists a scarcity of "Cat" equipment and engines for civilian use. So it is to *your* advantage to make the machines you now have *last*. You can keep them on the job longer by doing these things:

1 Follow sound and recommended operation and maintenance procedures to the letter. Read and reread your Operator's Instruction Book.

2 Make full use of your "Caterpillar" dealer's facilities for servicing and rebuilding machine parts.

3 Anticipate future parts needs, then contact your dealer and let him help. But *don't* buy or order parts you don't actually need.

Caterpillar Tractor Co. will do everything possible to maintain every "Caterpillar" machine in the field, to provide new machines as fast as possible, and to allocate them as fairly as possible.

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT

completes 40 basements in 7 weeks!

During spare time between tank jobs, Eisenhart fits his Bantam with larger 20" bucket and keeps busy digging house basements under sub-contract. In 7 weeks Bantam finished 40 basements, averaging two 30' x 20' x 5' excavations per day — including driving time to and from jobs.

YOU can get a **BANTAM** for only $6040

(Hoe, less Truck) F.O.B., Waverly, Iowa. Prices subject to change without notice.

M. S. Eisenhart, York, Pa., reports amazing economies in installing concrete septic tanks with truck-mounted Schield Bantam Trench Hoe. Equipped with 20" bucket and fast-change back-fill attachment, Eisenhart's mobile Bantam easily *excavates and covers 5 average-size tank installations in one day — more than double the output of any previous method!* The versatile Bantam also does trenching for house-to-tank connections . . . excavates seepage beds . . . uses 25' boom with clamshell bucket for digging deep cess pools, etc. You, too, can speed work, cut costs, with a fast-moving Bantam. Write today for FREE Bantam literature.

*Reg. U.S. Pat. Off.

TEAR OFF and MAIL THIS HANDY COUPON NOW!

Schield Bantam Co.
201 Park St., Waverly, Iowa

☐ Send FREE literature on truck-mounted Bantam.

☐ Include name of nearest distributor who sells, services and demonstrates Bantams.

I am interested in:
☐ Trench Hoe
☐ Shovel
☐ 5-ton Crane
☐ Dragline
☐ Clamshell
☐ Pile Driver

Name _____ Title _____
Occupation or Business _____
Address _____
City _____ State _____
SB-C-5

SCHIELD BANTAM
Costs less . . . travels 35 m. p. h.
GETS MORE JOBS DONE

NEWS BRIEFS

Rampaging bus causes fire hazard—At New Castle, Ind., a bus knocked over a fire hydrant and caused a shutdown of the pumps at the city water plant from midnight till 8 A.M. Rusted valve stems made it impossible to confine the water shortage to a small area, so the town was without fire protection for eight hours. Luckily there was no fire.

Tricky bridge moving—The Union Pacific Railroad is moving its tracks between Beatrice, Neb., and Marysville, Kan., out of reach of the sometimes rampant Blue River. Part of the project is the moving of the 80-ft, 110-ton Holmesville bridge to provide greater clearance above the stream. Besides moving it upstream to a higher location engineers have to reverse the grade and change its direction about eight degrees. To do this, they will build temporary trestles on each side of the stream, lay standard gage railroad tracks on them. Then they will jack the span up to the trestle level, lay it on standard railroad "trucks" and tow it upstream with a locomotive crane placed on the new track the bridge is to join.

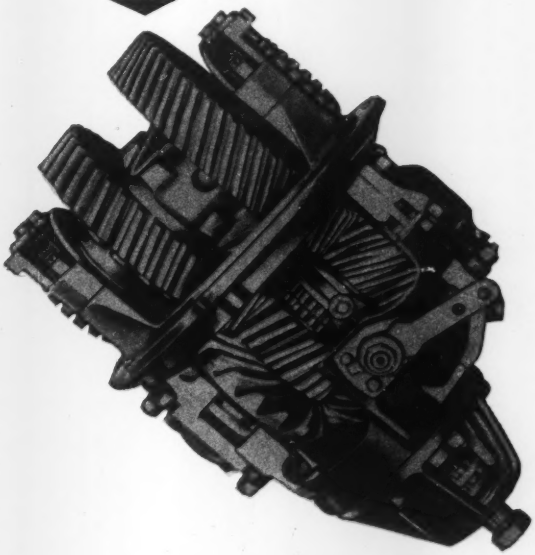
A long job—Application has been made for permits to build the tallest building since the Second World War in London's financial district—a 13-story block housing banks and insurance companies. It will cost about $23,000,000 and six years to build.

Should have been safe there—Before eye-catching stripes could be painted on the clear glass doors of the new Public Safety Building at Seattle, Wash., a citizen collided with one of the big portals, bruising his nose, blacking both eyes and breaking a tooth. Irate, he filed a $10,000 claim against the city.

"Woodsman, spare that tree!"—Embattled islanders of Martha's Vineyard, Mass., led by the famous "Vineyard Gazette" have saved from destruction a red maple which has long stood at the North Tisbury ford on Old Mill River. The state department of public works has given up plans to widen by 9½ ft the present bridge at the ford. Islanders don't want heavy trucks and buses on their old-fashioned roads. And a similar victory has been won in Dallas, Tex., where a curved concrete slab, 8 ft in dia. and 8 in. thick is being built around a 100-year old pecan tree to save it from destruc-

(*Continued on page 13*)

For tough, complete protection



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TRANSMISSIONS AND REAR AXLES DEMAND exacting lubrication. Like an armadillo's armor plating, it must be tough and strong. And, at the same time—it has to be exceptionally resistant to cold, moisture, rust, corrosion, heat and foaming. That's why more and more bus and truck fleet operators specify Quaker State Stabilized Quadrolube for transmissions and rear axles (except Hypoids). For Hypoids use Quaker State *Super Quadrolube*. Especially formulated for heavy-duty equipment, these lubricants embody all the unparalleled qualities of the 100% pure Pennsylvania base oil.

To give your equipment longer life—assure more dependable performance, use QUAKER STATE Superfine Lubricants.

A COMPLETE LINE OF FINEST QUALITY LUBRICANTS

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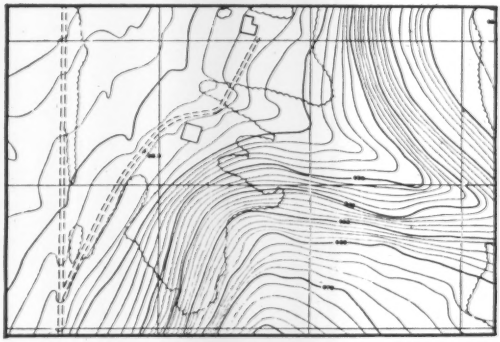
AERO RUSHES MAPS FOR AMERICA'S LARGEST DEFENSE PLANT

MAPPING PLANE *flew 200,000 acres in less than 2 weeks. Pilot-photographer team plans work before take-off.*

FIELD-SURVEY PARTIES *establish ground control for air survey. Radio transceivers facilitate communication between crews.*

PRECISE STEREOPLOTTING INSTRUMENTS *are used in compiling contour maps, on a round-the-clock schedule.*



RICH IN DETAIL *and reliable in topographic data, the aerial contour maps will be used for design and construction.*

MAPPING for America's largest defense plant—the AEC facility to be built in South Carolina—is already months ahead of the time required for ground surveys!

First photo-mapping flights over the 200,000-acre tract were made early in January. Fifteen days later, AERO delivered maps for the top priority 1,000-acre area. Working round-the-clock map compilation schedules, it will deliver maps for the entire area within five months.

AERO is doing this huge rush job because it has the equipment and trained personnel to deliver the maps with speed, accuracy and economy. AERO's record of furnishing detailed, dependable maps for such projects as the big Oak Ridge area and numerous war production facilities during World War II, make it a natural selection for this and other essential mapping today.

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tion when an alley is cut through. The city was going to cut down the tree but the owner, Mrs. Gladys Hubert, protested so vigorously that city engineers finally worked out the concrete slab idea to save the tree and have the alley too.

Wet use for dry ice—Several hundred dollars were saved at Atlanta, Ga., by the use of dry ice to freeze a broken water main. A paving contractor inadvertently struck and broke a water main at the edge of the pavement. The pipe ran some distance under the pavement and then back into an unpaved section. Ordinarily, the paving would have had to be ripped open for pipe repairs, but Supervisor Howard Bullard of the water department obtained some dry ice, dug down to the pipe in the unpaved section and froze the water in it. With the water temporarily stopped, the broken pipe was repaired without ripping up the pavement. When it thawed water service was restored to normal.

Safe beverages—It's safer to drink than to eat—provided you stick to milk and water. A recent U. S. Public Health Service report claims that disease attributed to water and milk declined more than 50% in the last 10 years while that traced to foods showed a steady increase. Reported waterborne infections in 1949 topped 1948 by 951 cases for a total of 1,570. But only 3 deaths resulted while 11 reported deaths occurred because of food poisoning. Nothing was said about beer.

The Cover

Water from the 464,000-ac ft reservoir behind Anderson Ranch Dam near Boise, Idaho, makes interesting patterns as it cascades down the 339-ft high concrete spillway. With the reservoir rising at the rate of almost two feet a day, Bureau of Reclamation engineers began releasing water late in April.

The spillway is designed for a maximum discharge of 20,000 cfs, and is located in the left abutment of the dam. It is a concrete-lined, open-channel type of structure, with a discharge into a stilling basin. Control is effected through two 25 x 22-ft. radial gates, mounted to seat on a low ogee section at the inlet.

The spillway height alone is almost twice that of Niagara Falls, the dam it serves is 456 ft above bedrock at its highest point—highest earthfill structure in the world. Its reservoir will provide additional water for the Boise irrigation project, flood control on the Boise River, and the powerhouse at left will have an eventual capacity of 40,500 kw.

Preferred power for garden tractors and a wide range of other agricultural equipment — the world's most widely used single-cylinder gasoline engines on machines and tools for industry, construction, railroads, oil fields, etc., and on appliances and equipment for farm and home.

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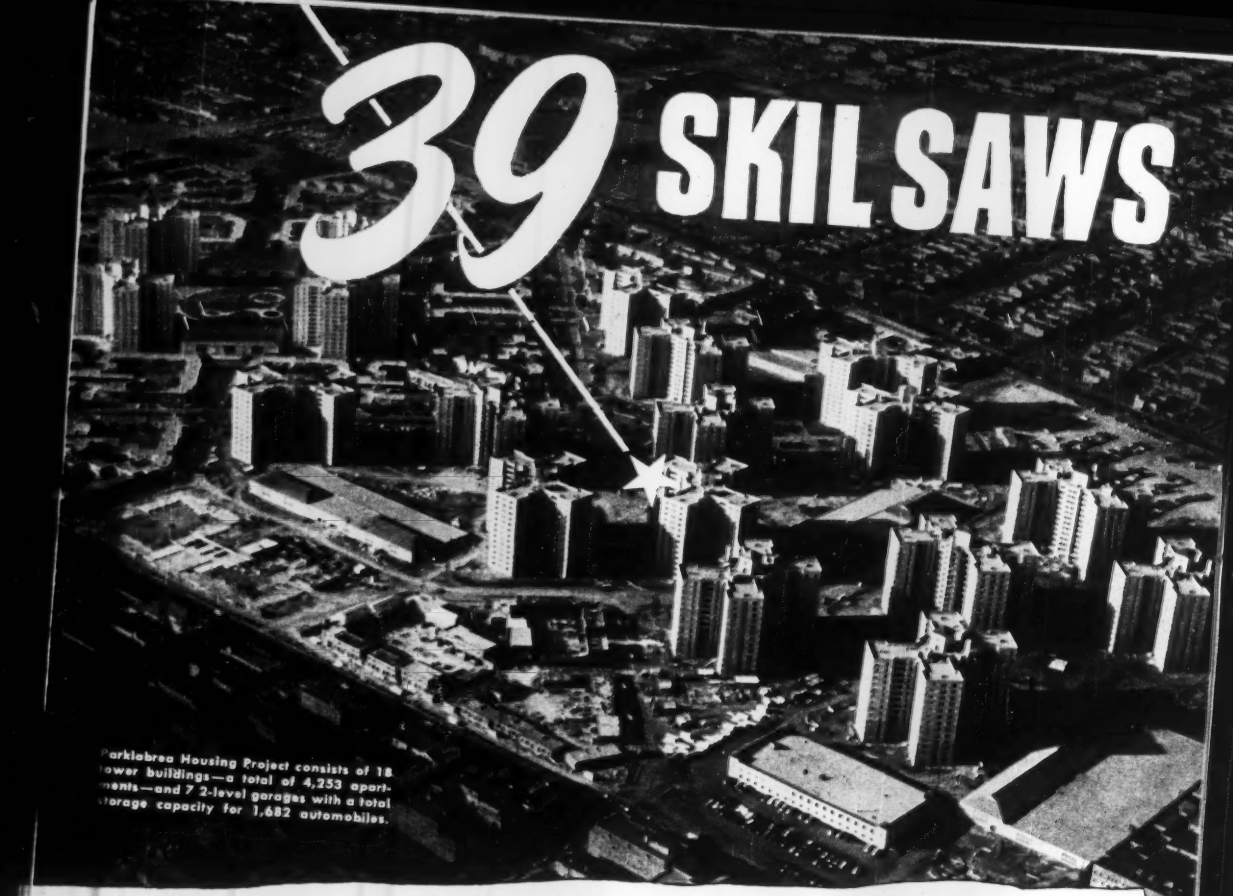
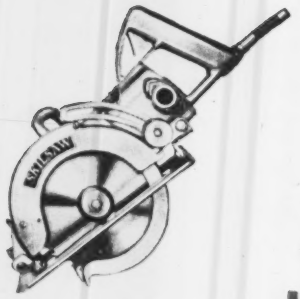
39 SKILSAWS

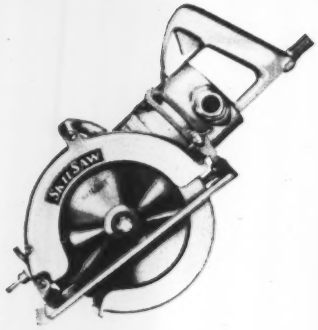


Parklabrea Housing Project consists of 18 tower buildings—a total of 4,253 apartments—and 7 2-level garages with a total storage capacity for 1,682 automobiles.



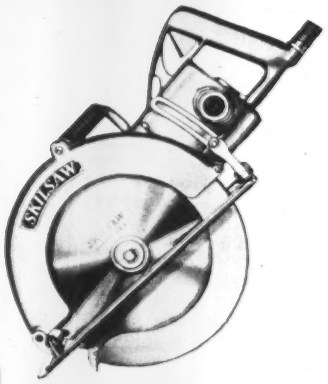
SKIL Saw—Model 77

7¼" blade. Base adjustments: 0" to 2⅜" vertical depth of cut. 0° to 45° bevel adjustment. 1¾" depth of cut at 45°. Handles scientifically placed for either one hand or two hand operation in any position. Overall length: 17¼"; weight: 15¾ lbs.



SKIL Saw—Model 825

8¼" blade. Base adjustments: 0" to 2⅝" vertical depth cut. 0° to 45° bevel adjustment. 2⅛" depth of cut at 45°. Withstands hard use in gang cutting. Overall length: 18"; weight: 17¼ lbs.



SKIL Saw—Model 127

12" blade. Base adjustments: 2⅜" to 4⅜" vertical depth of cut. 0° to 45° bevel adjustment. 3¼" depth of cut at 45°. Most powerful and fastest cutting electric hand saw ever made. Overall length: 22"; weight: 34 lbs.

Cut 4,000,000 board feet of lumber 2,760,000 square feet of plywood

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More than 63 acres of plywood! More than 776 miles of lumber! With this amount of lumber to cut, you just don't risk any substitute for SKIL Saw precision and dependability.

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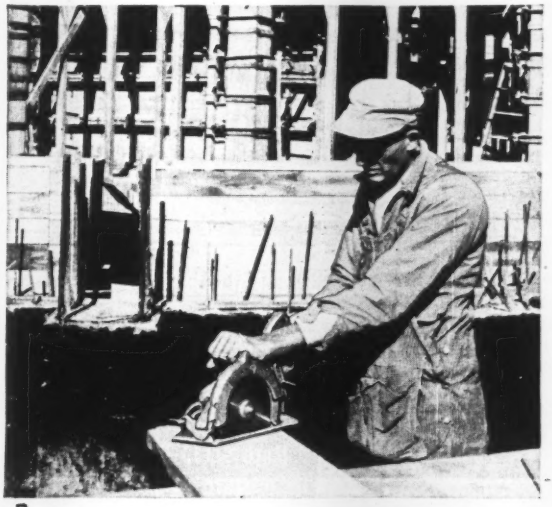
Few projects can compare in size to this 40 million dollar housing project—but large or small, you'll find SKIL Saws will save hours of time and work. There's a SKIL Saw to fit your job—10 models—each one perfectly balanced for easy handling, power-packed for accurate, fast performance on an almost unlimited variety of building materials. Call your nearby SKIL Distributor today for an on-the-job SKIL Saw demonstration.



SKIL Saws are job-proved for construction work, provide high-torque performance on an almost unlimited variety of building materials. With suitable blades, SKIL Saws cut or score wood, metal, stone, concrete and composition materials. Your SKIL Distributor will make recommendations for the right saw with the right blades for every job.

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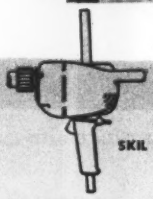
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SKIL Belt Sander

SKIL Driver

SKIL Disc Sander

Engineering Advantages and Uses of Armco Steel Pipe

Armco Welded Steel Pipe is a spirally wound and welded pipe made on automatic machines from coils of specially-prepared flat steel. It has many desirable advantages.

1. WIDE RANGE OF SIZES. Diameters from 6 to 36 inches with wall thicknesses from $^{9}/_{64}$- to $^{1}/_{2}$-inch enable you to meet exact job requirements without buying excess metal.

2. LENGTHS UP TO 50 FEET. Armco Pipe is supplied in any length up to 50 feet. Long lengths mean fewer field joints and lower handling costs.

3. STANDARD OR SPECIAL FITTINGS. Standard dimensional fittings such as tees, wyes, elbows and crosses are readily available for use with Armco Steel Pipe. Special fittings are fabricated to individual specifications.

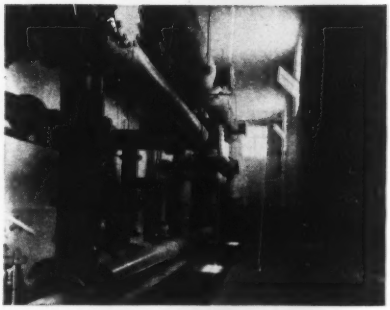
4. UNIFORM WALL THICKNESS. In Armco Pipe you are assured exceptional uniformity in strength and wall thickness because the steel is held to the close under-thickness tolerance of 0.01 inch.

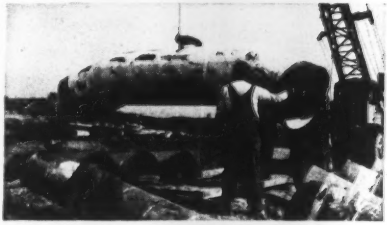
5. ADAPTABLE TO FIELD FABRICATION. Armco Pipe can be readily cut to length on the job. Ends may be supplied beveled for field welding, or for use with steel flanges and other standard couplings.

6. HIGH FLOW CAPACITY. Armco Welded Steel Pipe is smooth inside for high flow capacity and easy cleaning.

7. AMPLE STRENGTH AND DUCTILITY. Armco Pipe is uniformly strong and ductile. It is made from steel of recognized welding quality. Every foot of pipe is carefully inspected and hydrostatically tested before shipping.

8. MILL APPLIED COATINGS. You can have Armco Pipe red mill-coated, hot-dip galvanized to ASTM Specification A 123, or coal-tar enamel protected in accordance with AWWA Specifications 7A.5 or 7A.6.





Where Armco Pipe Can Help You

1. Water supply lines, force mains, bridge crossings and filter plant piping.
2. Pressure trunk and outfall sewer lines.
3. Foundation pipe piles and caissons.
4. Plant process piping.
5. Shore and pontoon dredge pipe.

ARMCO

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More scrap means more steel
turn yours in today!

THE CONSTRUCTION WEEK

MORE JOURNEYMEN, TEMPORARILY—Apprentice graduations in construction trades exceeded journeyman attrition by half (18,000 in, 12,000 out) in the two years before Korea, thanks to strong union, contractor and government cooperation. Such a favorable rate might continue for two more years, but today apprentices are dropping out faster than they are being indentured. Losses to the armed forces now are 1,000 a month.

MORE QUICK AMORTIZATION—In spite of Congressional inquiries concerning justification of rapid amortization for all the defense plants approved for certificates (ENR April 19, p. 27), the Defense Production Administration approved 94 certificates in the week of April 9-April 13 alone—for a total value of $218.5 million. By then, DPA had approved certificates of necessity for rapid amortization for new defense facilities valued at $4.6 billion.

BASING POINTS—UP AGAIN—The battle over basing point charges is on again in Congress, after lying dormant for nearly a year. Every year since the Supreme Court threw out the basing point charges (for the cement industry) in 1948, bills have been introduced in Congress in an attempt to liberalize the law and clarify the Supreme Court's dictum. The last such effort—a bill that would have permitted absorption of freight rates—died under Presidential veto last June (ENR June 22, 1950, p. 25). Now Congress wants to write a new law that would include the high court's recent interpretation that it's legal to meet a competitor's price, so long as the meeting is done "in good faith." They think there's a much better chance now of getting the law through both Congress and the White House—particularly in view af action by the Senate Judiciary Committee last week in which it approved legislation to permit manufacturers to absorb freight charges to meet competition.

OHIO GETS OUTSIDE HELP ON ROADS—Because regular maintenance crews are unable to cope with the extensive highway damage caused by severe weather last winter, Ohio has taken bids for more than $2 million worth of road repair. This is the first time Ohio maintenance work has been let to contract. A few other states have done it since World War II.

CONSTRUCTION IN HAWAII—The 14th Naval District plans to spend $60 million on construction in Hawaii in the next 18 months. One item understood to be planned is a $10-million project to turn the former Kaneohe Naval Air Station into a permanent base for a Marine Corps regimental combat team.

SECOND BID LOWER, BUT NOT LOW ENOUGH—The Florida State Road Department tossed out for the second time a combined bid for a substructure and superstructure of the Gilmore Street Bridge (part of the $50-million Jacksonville Expressway project) in Jacksonville. Both bids were submitted by the Industrial Construction Co., Minneapolis, Minn. The rejected bid for $5,207,831 was $261,344 lower than the original one, but was still $605,000 above road department estimates.

ALUMINUM POSSIBILITIES—The Aluminum Company of America has a new aluminum alloy for aircraft which is 10% stronger than any now in use. At present it is available for experimental and controlled production purposes only. Designated temporarily as XA78S, it is stronger than the popular alloy 75S and may be another step toward greater utilization of aluminum alloys for structural uses in construction.

Here is a picture you helped us to paint

This month of May marks an important milestone in our relationship with you. It's the 50th birthday of our Indiana Harbor works.

Naturally we're a little proud of the growth of "The Harbor" from a sandy wasteland to an efficient steel-making facility. But, more than that, we're grateful to you . . . our customers, suppliers and friends . . . for making the growth possible.

So, without the usual anniversary platitudes, we say sincerely, "Thanks."

(By the way . . . the picture on the right is rapidly becoming obsolete as we further expand our ingot producing facilities by another 20%).

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INDUSTRIAL CONSTRUCTION BOOM INDICATES A YEAR OF SHORTAGES

Construction demand for critical materials is expected to be greater in 1951 than last year's actual consumption—which was the largest in history.

Total construction expenditures probably won't be so high this year. Current estimate is $25 billion as against $27.7 billion in 1950. But the switch in types of construction—especially from homebuilding to industrial work—will boom demand for scarce steel, copper and aluminum.

With the military take rising through the year, there'll be more delays in critical metals for construction.

Shortages loom for other building materials, too. Local shortages of cement are likely, and stocks of some other materials are dangerously low.

But the picture is not all black. Production is at high levels for most building materials not made of metal. And government—through the Controlled Materials Plan—will see that essential projects get materials. Even non-essential jobs may get help if they are tied up by lack of a critical product.

CRITICAL METALS—Steel is a big problem. Expected construction for 1951 will require 15 million tons, compared to consumption of 14 million tons last year. Thus construction is asking a large share—about 18.8%—of all finished steel.

New projects started in March alone will require an estimated two million tons before they are complete. Taken together, all projects under way at the end of March call for an additional 7.75 million tons of steel before completion.

Such heavy demand promises to cause trouble. Construction will be competing with direct military demand for about 20% of all finished steel, and with a record program of capital investment in industry.

Some forms of finished steel will be especially short. NPA recently ordered mills to set aside 30% of heavy shapes and piling for defense-rated orders. Rolling capacity for these products and for steel plate can't meet this year's heavy demand.

Steel shortages mean slow deliveries for projects without priorities. Delivery dates on new orders for structural steel already stretch up to six months, a year or even longer. Delivery dates will be pushed back even further as the military takes more and more of the available steel.

Other costly delays can be expected in copper and aluminum products. Limitation orders have had small effect on the total construction demand for these metals. Total demand for the year is now expected to be close to last year's consumption.

With military requirements taking 40% of aluminum and copper later this year, deliveries for non-essential projects may be seriously slowed down.

Government, through the Controlled Materials Plan, will see that essential projects get the steel, copper and aluminum they need. Other projects should get metals, too—Washington officials plan to help jobs held up by lack of critical materials. But there may be costly delays before delivery can be made.

OTHER MATERIALS—Production of most other building materials is high. But demand threatens to outrun even the present high output, create more shortages.

Problems already are mounting for lumber. Output has been above last year, except for southern pine, but shipments and new orders have run ahead of production. Mill stocks are low—down to less than 6.5 billion feet in March. In January, retail stocks climbed to 5.3 billion feet, highest level since the war. But that's still low in comparison to the current rate of use.

For softwood plywood, both production and consumption are at record levels. No serious shortages are reported at retail yards, but distributors' stocks appear to be so low that shortages may come soon.

Observers can't agree about cement. Some expect a general shortage again in 1951. Others feel that shortages will be local and spotty.

Cement stocks at the end of February amounted to 22 million barrels—1.5 million below a year ago. The gloomier prophets look at construction activity—running 20% above last year—and predict a cement shortage by the third quarter, even with new plants coming into production.

Shortages of plumbing and heating supplies have already caused some construction delays. Shortages followed a year of record production, especially high in the last quarter of 1950. It is reported that lack of iron and steel caused a big drop in output of plumbing fixtures in the first quarter of 1951.

Electrical conduit and conduit fittings may run short by the end of the third quarter. Lack of zinc is holding down conduit output. Makers of fittings are expanding capacity, but new capacity big enough to meet demand won't be finished until late in the year.

Output of low voltage distribution equipment is growing, should be equal to demand.

THE OUTLOOK—Supplies of major construction materials are expected to get much tighter as the year advances. Delays will increase on steel, copper and aluminum deliveries—in spite of government assistance to builders. Output of most other materials is high, but shortages of cement, lumber and other materials are definite possibilities.

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NAM backs pollution control

WELCOME SUPPORT for the river clean-up programs of pollution-control agencies has come from the National Association of Manufacturers. The association's Conservation Committee proposes that the association work for changes in tax laws that would permit manufacturers to amortize over a five-year period the cost of waste-disposal facilities that produce no income, instead of amortizing them over the period of the estimated useful life of the facility. David Graham, chairman of the committee, states that such a provision would provide a way to attack this aspect of the nation's pollution problem without resorting to the use of public funds.

A surprising number of manufacturing companies have gone ahead with the installation of waste-disposal facilities without the tax relief favored by the NAM, and some have found that the cost has been offset in part by incidental benefits. Such a tax-relief plan as is now proposed should encourage more industries to take a similar step. Consequently, if the NAM backs its committee it should be supported actively by public-health agencies and pollution-control commissions.

Modernizing codes cuts building costs

IMPROVEMENTS have been made steadily in the design of earthquake-resistant buildings in Los Angeles, tending either to lower construction costs or to yield better buildings for the same money. Two factors—probably interrelated—are responsible for these gains: availability of imaginative building designers and existence of an up-to-date, intelligently administered building code.

The trend toward more economical design in Los Angeles since the end of World War II may be seen in the Prudential and General Petroleum Buildings built in 1949 (ENR July 28, 1949, p 38). Best current example is the group of three 12-story buildings now being constructed for Tishman Realty and Development Corp., and described last week (ENR April 26, 1951, p 39). In these structures, the light-gage steel floor systems were designed to act as diaphragms, to transmit lateral or seismic forces to reinforced concrete shear walls. Carrying only vertical loading, the structural frames thus are lightweight and low-cost.

These savings in materials and money were made possible by recent changes in the Los Angeles building code. They point up the advantage of having a code that will permit new materials and methods of construction, or that can be revised quickly and with little expense. Moreover, such a code, intelligently administered, stimulates designers to try new schemes that offer possibilities of lowering building costs.

Other large cities, too, have recognized the potentialities of an up-to-date code, Chicago, Cleveland and New York being recent examples. It is when one turns to the smaller communities that the principal backwardness in codes is encountered. In New York state, for instance, only 66 of over 300 communities have revised their building codes since original adoption.

Outmoded building regulations add unnecessarily to the cost of construction and are wasteful of materials. Sometimes, also, they contain provisions that once were considered adequate but are now known not to be on the safe side. As a result, a demand has been created for state building codes. If communities are compelled to give up local jurisdiction over building construction to state bodies, they will have only themselves to blame. They can stop the trend to state building regulation by following Los Angeles' example—by bringing their codes up to date and keeping them that way.

A good example to follow

FOR MANY YEARS, the New York City Planning Commission has been studying the city's 55-year-old zoning regulations, which it considers inadequate. It wants a law that will prevent overbuilding, preserve property values and ease traffic congestion, thus making the city a better place in which to live and work. This week, the commission issued a report on the findings of its consultants, Harrison, Ballard and Allen. Shortly thereafter—as noted elsewhere in this issue—the New York Chapter of the American Institute of Architects released a 59-page booklet analyzing the report.

Aiming at promoting the widest public understanding of the report, the architects present in this booklet the need for a completely new approach to zoning in New York City, a brief description of zoning requirements proposed by the consultants and a comparison of the existing and proposed regulations. Most important, this material is presented in a simplified, easily read form. After studying this analysis, lay groups should fully appreciate the significance of the drastic changes recommended by the consultants.

In making this analysis available, the architects have performed a valuable public service. At the same time, they will reap several benefits: They have an opportunity to influence public opinion on a pending legislative matter affecting building construction. They are getting publicity that will increase their prestige, and they may improve conditions in the city in which they themselves live and work.

Architect, engineer and contractor groups in other cities will find it well worthwhile to emulate this action by the New York architects. No one is better qualified than they to explain and interpret to the general public legislation affecting construction. In making clear to the voters, the significance of pending legislation, they, like the New York architects, will not only be performing a public service but will gain material profits as well.

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Fairfax Pump Station, Memphis, Tenn. — where a Moretrench Wellpoint System moved in and 17 feet of water moved out!

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ENGINEERING NEWS-RECORD

MAY 3, 1951 VOL. 146 NO.18

Price regulation affects materials and equipment

Ceiling prices for construction to be refigured—Downward adjustment slated for items having big increases, upward for those caught short by freeze

Ceiling prices for most building materials and construction machinery will be refigured under new regulations of the Office of Price Stabilization. OPS last week issued a general price ceiling regulation for manufacturers. A supplementary order is expected this week for machinery manufacturers, including producers of construction equipment.

If the machinery regulation comes out on schedule, both it and the general manufacturers' order will take effect on the same date, May 28. Until new ceiling prices become effective, the price for all products remain under the general price freeze regulation of January 26. Materials and products excluded from the new orders likewise continue under the January price freeze.

• **Equalization**—Purpose of the manufacturers' price regulation is to make a downward adjustment of prices that have increased excessively from June to January and to allow relief for producers whose prices were too low when they were caught by the January freeze order.

In general, the regulation issued last week sets ceiling prices at a pre-Korean base, plus increases in materials costs up to December 31, 1950, and increases in factory payrolls costs up to March 15, 1951.

Similar basic provisions were to apply also in the machinery regulation. But this later order was expected to make some allowances for cost increases that were barred in the general manufacturing regulation.

Among these, added allowances for machinery manufacturers were increases in costs for product engineering and development, for installation labor, and possibly for payment of overtime wages.

None of these cost increases can be used in figuring the ceiling price for a product under the general manufacturing order. That order specifically disallowed increased costs for general overhead and administrative expenses, sales promotion, advertising and overtime pay.

• **Reports and reviews**—All manufacturers must file reports on their ceiling prices with OPS in Washington, by May 28, on forms that can be obtained from any OPS office. Further, the order specifies that no manufacturer may raise his price above the present ceiling without first notifying OPS 15 days in advance. The price stabilizers will review the new price in that time and disallow it if not justified. No price above the present ceiling can be put into effect by a manufacturer before May 28.

A manufacturer with gross sales under $250,000 may retain his present ceiling price, under the freeze order, if he prefers. Similarly, a manufacturer whose recalculated price comes within 1% of his freeze price may continue to use the present price, if he wishes.

• **Net decrease expected**—Director Michael V. DiSalle of OPS expects the manufacturers' orders to result in a net rollback of prices. Some prices will advance under the orders, but others will be reduced, and OPS looks for an overall net decrease in costs to consumers.

On building materials, the results of the new pricing regulations are hard to estimate. A number of materials were exempted from the general manufacturing order.

Among these products are lumber, fabricated structural steel and reinforcing bars, Portland cement, ready-mixed concrete, sand, gravel crushed stone, lightweight aggregates, lime, and calcined gypsum plasters.

Lumber was excluded, OPS says, because of the difficulty of computing costs under any general formula. All these materials remain for the present under existing price regulations—principally the freeze order.

Prices of other building products

(*Continued on page 24*)

New M-4 order will broaden controls

The National Production Authority plans this week to extend construction controls to industrial, heavy residential and other types of building not now covered by NPA order M-4. By last weekend, the agency had disclosed the necessity for the extension and had put itself in a position that demanded prompt action on the amendment of M-4.

Only questions of detail prevented NPA from completing and issuing the new order before midnight of last Friday, April 27. That date had been proposed by top officials as the cutoff time for starting projects without permits. After the deadline, all jobs covered by the extension will require NPA authorization before ground can be broken.

Advance information on the new order indicated that it would vastly broaden the scope of construction controls. NPA was thinking of applying it to all kinds of steel-consuming projects except those built under direct defense programs of the federal government. If made that broad, the extension of M-4 would cover state and local public works, as well as industrial construction and housing projects above a certain size.

Impending shortages of structural steel brought the controls problem to a head. NPA Administrator Manly Fleischmann said last week that the heavy demands of planned industrial expansion, coupled with the requirements of federal defense projects, would leave no structural steel for other essential purposes.

Wider construction controls are imperative, he made clear, if the annual output of about 5.5 million tons of structural steel is to be used where it will do the most good.

Many industrial firms, Fleischmann said, will probably have to postpone for a year expansion plans not directly connected with the defense effort. Some highway projects and apartment houses also will have to be deferred, he said.

A meeting of the CIAC has been scheduled to take place this week in Washington.

AWPA seeks defense recognition

The wood preserving industry believes it should be classified by the Department of Commerce as an essential industry during the present national defense program. This was brought out in a resolution adopted at the 47th annual meeting of the American Wood Preservers' Association last week in Chicago. During the last war, the industry enjoyed such a rating and its members believe it is equally essential to the present production effort.

A good share of the sessions at the three-day meeting were devoted to technical discussions relative to recommended practices for improving methods of treating wood, revision of the association's standard manual, and descriptions of fundamental research in wood preservatives.

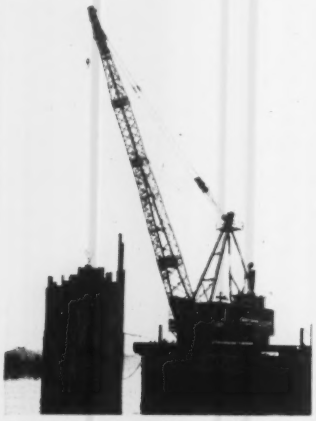
• **Better timber for railroads**—Wood products are the largest single item of expense in railroad maintenance, declared L. A. Blair, chief engineer, Atchison, Topeka and Santa Fe Railway. Consequently, the railroad industry has taken advantage of the many advancements in the art of wood preservation to obtain maximum service life from treated timber.

As an example of improved treating methods, the service life of the Santa Fe's treated timber bridges is now estimated to be 40 years. Twenty years ago it was only 30 years.

Factors affecting this increase in service life, said Blair, include: The use of only the best grade of structural timber in bridge construction; quick delivery of green timber to the treating plants and chemical pre-treatment, followed by proper stacking for seasoning; standard bridge designs to permit cutting timber to length, framing and boring prior to treatment; proper preservatives and treatment processes; and care in handling after treatment and during construction.

• **Marine pile failure**—For many years efforts have been made to determine the grade or type of creosote most suitable to protect marine piling from borer attack. At the present time, however, said W. F. Clapp, of the William F. Clapp Laboratories, Duxbury, Mass., practically all failures from this source can be attributed not to the type of creosote used, but to the acceptance of materials which fail to meet standard specifications.

Conclusions of a paper on the treatment of Douglas-fir by H. J. Raphael, Dow Chemical Co., and R. D. Graham, Oregon Forest Products Laboratory were: Longitudinal penetration of petroleum oils generally continues in Douglas-fir heartwood after treatment.



BOOM OVER THE WATER—Merritt-Chapman & Scott derrick places a shallow-water cofferdam for the sub-structure of Arlington Bridge over the St. John's River at the eastern edge of Jacksonville, Fla. The 7,375-ft bridge will be a major unit of the Jacksonville-Duval County Expressway. Contract for the piers is for $3,588,959. Bethlehem Steel Co. has a $7,376,712 contract for the superstructure. The main span will be an 810-ft cantilever truss. Channel clearance is to be 149½ ft.

Price regulation slated

(*Continued from page 23*)

may be changed by the general manufacturing order. BLS indexes of wholesale prices for several materials indicates a few places where changes might be expected. The price index for plumbing and heating supplies, for example, went up 17.5% from June 1950 to March 1951. If the wholesale price is a good indication of the manufacturer's price, some rollback may be possible for these products.

• **Little change expected**—Paints and paint materials likewise rose sharply between June and March. The BLS index shows a 19% rise. But a good part of this increase may be the result of greater costs for oils and other ingredients, lessening the chance for price reduction.

Brick and tile showed a moderate increase in the nine months, with the wholesale price index going up 10%. There would seem to be little margin here for a rollback. Increases likewise were relatively modest for two materials excluded from the manufacturers general pricing order: Cement, up 9%, and lumber, up 12%.

Fabricated steel orders remain in high volume

March bookings of fabricated structural steel totalled 230,409 tons, to make the tenth consecutive month in which contracts awarded have exceeded 200,000 tons, reports the American Institute of Steel Construction.

The March bookings represent a 12.3% gain over February. Shipments during the month were 194,774 tons, an increase of 16.7% over February, and were the highest reported since October, 1947.

The backlog (tonnage available for future fabrication) for the next four months, however, stands at only 798,356 tons—and beyond that period another 1,514,980 tons of work shows on the industry's books, AISC states. This backlog represents a potential volume of 2,313,336 tons, compared with 2,228,495 tons on February 28.

Bookings for the first three months of 1951 now stand at a total of 722,837 tons, compared with 426,401 in the same period of 1950. Shipments of 1951 total 540,755 tons, compared with 421,662 in the first quarter.

Military clarifies policy on recall of reservists

Clarification of policy by the U. S. armed services on recall of reserve officers and enlisted personnel last week brought some sighs of relief.

At the same time, the National Security Resources Board turned up with a plan, developed by its Scientific Manpower Advisory Committee, that would provide for a "flow-back" to college of certain students—after they have been drafted into military service.

Briefly, inactive reservists (not being paid for the time spent in reserve training) will no longer be called involuntarily. The only exceptions will be officers who hold certain critical skills.

Army and Air Force—will not call any more inactive enlisted reservists; inactive officer reservists will be called only when they have skills not available from organized reserves.

Navy—Is calling inactive reservists only when organized reserve units can't supply the men of necessary special skills.

Marines—Will call only those inactive reservists with specialized training needed to fill specific jobs.

However, said the services, most of their organized reserves will be recalled by July.

• **NSRB plan**—Under the proposal of the Scientific Manpower Advisory Committee, all 18-year-olds would go into service. After four months, about 75,000 would be selected to come out of training and enter colleges.

Import ore pier completed by Baltimore & Ohio R. R.

Construction of the Baltimore & Ohio Railroad's new $5-million pier in Baltimore, to transfer ore from ocean-going vessels to railroad cars, has been completed.

Work was started on the ore-handling facility in January, 1950 (ENR June 8, 1950, p. 54). It is 650 ft long and incorporates two ore unloading machines that have a combined, sustained capacity of 2,000 tons per hour.

The pier was built specifically to facilitate the movement of ores arriving from foreign sources and is equipped to unload the largest ocean-going ore-carrying vessels within 24 hours. It is adjacent to the B & O's large export coal pier at Curtis Bay. Hopper cars emptied at the coal pier will be available immediately for imported ores.

Iron ore from Liberia, Venezuela, Chile, Cuba and other overseas sources is expected to move through the pier. Manganese, chrome and other ores are also anticipated.

Pier construction was by the Empire Construction Co., Baltimore; ore handling equipment was built by the Dravo Corp., Pittsburgh; and the dredging of the necessary channels and affiliated work was done by the Arundel Corp., Baltimore.

Aerial mapping firms form trade association

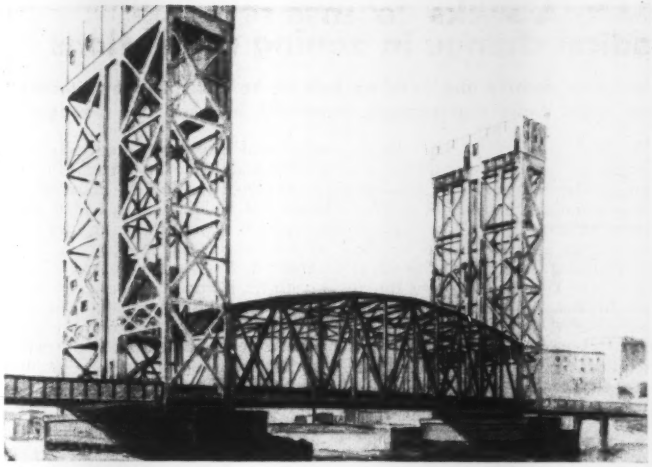
Four photogrammetry companies have founded the Association of Professional Photogrammetrists, with headquarters at 17 Dupont Circle, Washington, D. C.

Members are civil aerial-mapping organizations which are equipped to perform contracts for making precise mosaic, planimetric and contour maps from aerial photographs.

At present they include Aero Service Corp., Philadelphia, Jack Ammann Photogrammetric Engineers, San Antonio, Tex., Fairchild Aerial Surveys, Inc., Los Angeles, and Lockwood, Kessler & Bartlett, Inc., Great Neck, N. Y.

Secretary of the organization is Fowler W. Barker, former secretary-treasurer of the Air Transport Association, and editor of Air Transport Magazine.

In a letter to the American Society of Photogrammetry, Barker has given assurance that the professional photogrammetrists will not duplicate the older group's functions. The new group is interested primarily in maintaining the strength of the civil photogrammetry industry.



N. Y. Central begins $10-million bridge

Plans are complete and construction is expected to begin this week on the substructure of a new four-track vertical lift bridge for the New York Central Railroad to span the Harlem River in New York City (ENR April 26, p. 17).

Estimated to cost more than $10 million, the bridge will be constructed immediately to the west of the present swing bridge—which it will replace following completion scheduled for 1954. The first step will be the sinking of five concrete piers into the riverbed. The two main piers supporting the 340-ft lift span will be 25 ft wide, 101 ft long and will be sunk to a depth of 81 ft below the water level.

Joint contractors for the substructure are Walsh Construction Co., Peter F. Connolly Co., and Senior & Palmer, Inc. Bids have not been taken for the superstructure. Design is by the New York Central engineering department.

The new structure and its approaches will total 2,227 ft in length. Starting the work at this time permits coordination of the project with highway improvements which the city and state plan to make near both ends of the span.

The lift span will be activated electrically, aided by steel-encased concrete counterweights. It will rise to a height of 135 ft above the water and will provide a channel 225 ft wide for vessels. It will open and close in four minutes and will incorporate twin units of two tracks each which can be raised independently if necessary.

When completed, the bridge will carry all Central and New York, New Haven & Hartford Railroad trains using Grand Central Terminal—totaling about 600 trains daily.

Michigan moves to replace burned out office units

Governor G. Mennen Williams of Michigan has now named a State Building Commission to plan for state office building facilities. Land back of the Capitol will be used for the purpose.

Work will be expedited to provide permanent housing for state agencies burned out by fire in February which brought a loss of $5 million to the state.

First project to be urged will be a new $4-million office building which has been under discussion for many months. Rehabilitating the gutted building and expanding its facilities is included in the plans.

Site offer renews steel plant hope for New England

The Connecticut General Assembly has been considering a bill that would authorize sale or lease of a state-owned airport near Groton to any concern that intends to build a steel mill there.

The airport is known as Trumbull Airport and comprises about 425 acres.

Until this offer was forthcoming, the site of a planned $220-million New England mill had been tentatively set at New London—west of Groton (ENR Mar. 8, p. 17). However, investigations have indicated that the difficulty of assembling a site in New London from private landowners would throw new obstacles into the path of the proposed mill.

NYC Planning Commission proposes a radical change in zoning regulations

Population density and building bulk to be controlled by limiting floor area; light requirements measured by series of "wedges"

A method that makes drastic changes in present procedures for limiting the height, bulk, area and type of buildings that may be built in various parts of New York City is proposed in a report issued by the City Planning Commission this week.

The New York chapter of the American Institute of Architects immediately backed the proposal by making public a simplified analysis of the resolution. While the architects endorse the general principles of the proposed law, they also point to the need for further discussion before adoption of some of the provisions.

The 59-page analysis, "A Review of the Proposals for Rezoning New York City," was prepared by Bruno Funaro and Geoffrey Baker, under the direction of a committee on civic design headed by Geoffrey Platt. It may be obtained from chapter headquarters, 115 E. 40th St., New York 16, N. Y.

The booklet evaluates the findings of the planning commission's consultants, Harrison, Ballard and Allen.

• **New approach needed**—In criticizing the existing zoning law, the architects pull no punches. They call it "a cumbersome and inadequate medium for regulating the city's growth."

The law was promulgated in 1916, making New York the first city in the U. S. to adopt zoning regulations. Though incorporating many amendments, this zoning regulation, legally known as a resolution, is still in force.

In recent years, it has been subject to widespread criticism because it permitted excessive building bulk and height, but the first major change was not made until seven years ago (ENR Dec. 28, 1944, Vol. p. 835). Overbuilding, the planning commission reported in 1944, has had serious consequences in New York: Gigantic buildings tend to destroy the value of other buildings and other land and are responsible for traffic congestion. The commision recommended further restrictions on the height, bulk and area of future construction, and the Board of Estimate voted approval.

In approving the changes, however, the board stated that the amendments admittedly were imperfect, but they would provide an interim measure of protection until studies leading to a complete revision of the zoning rules could be completed. Results of these studies are embodied in the proposed zoning resolution discussed in the planning commission's current report.

• **Old and new laws compared**—The architects consider the existing zoning resolution biased heavily in favor of residential buildings. Residential districts are now protected from invasion by industrial buildings, they say, but industrial districts are not protected against the intrusion of housing, which chokes off industrial growth. Yet, industrial and business districts are just as necessary as homes. These districts, the architects claim, are the reason for New York's existence as a city.

The proposed resolution bans residential building completely from those zones allotted to industry, as well as banning industry from residential areas. In intermediate zones, housing is permitted but discouraged by more stringent regulations than apply to the types of building for which the zone in question was intended.

• **Congestion prevented**—Since the character of a district is also influenced by the density of population, both resolutions attempt to control it. Under the existing law, density is restricted in certain residential zones by exact specification of permissible building types—single-family houses, semi-detached houses, row houses.

Under the proposed law, density will be controlled by limiting the total floor area in the buildings. However, zones for single-family houses may be created in districts where the majority of property owners favor them.

To provide open space around buildings, the existing resolution limits the height of the street side of the structures. Frontage above this level must be set back; towers may cover only 25% of the lot. An elaborate schedule of minimum sizes for courts and yards also is specified.

For large buildings, the architects report, this becomes extremely complicated, and for large projects, involving a group of buildings, it becomes almost impossible to distinguish between rear yards, side yards, and inner and outer courts.

As in the original resolution, the proposed regulations also limit the height of street frontages but do it in a way that should result in more efficient and attractive structures in the future.

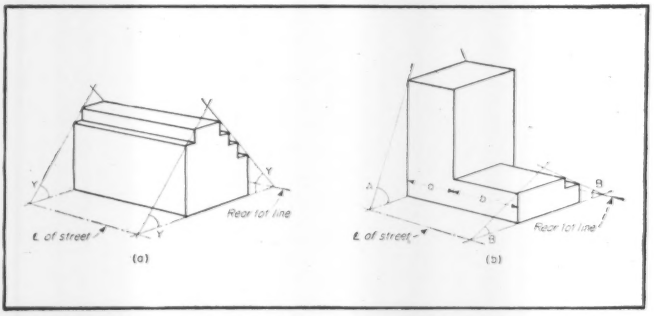
Designers will be permitted to average the height over a limited frontage, so that some sections of a building along a street may exceed the specified limit, provided other sections of this frontage are below the limit. Thus, the street will get the same amount of light and air as before, but designers will have more freedom in determining the shape of structures and their location on the site.

To make certain that windows receive sufficient light and air, the new regulations prescribe a certain amount of unobstructed space outside each window, depending on the type of occupancy.

• **Population-density limit**—In view of the impracticality of limiting the population density of any district of the city by specifying the maximum number of people permitted there, the proposed law seeks to accomplish this objective by controlling the total floor area of the buildings in the district. Each zoning district is assigned a maximum floor area ratio—the ratio of the total allowable floor area in a building to the area covered by the lot.

Suppose, for example, the floor area ratio for a district is 4. Then, a building in that zone occupying half the lot may be 8 stories high; or if it covers only 25% of the site, it may be 16 stories high.

Under the proposed regulations, height of building is limited by assigning maximum angles of light obstruction to each district. Similar to



HEIGHT of buildings will be controlled by angle of light obstruction Y. For irregular heights, the angle may be averaged by the formula $Y = (Aa + Bb)/(a + b)$.

the present regulation of height and setbacks, these limiting angles form a restrictive envelope over the structures in the zone. Measured from the centerline of the street and from the rear lot line, the angles assure that adequate light and air reach the streets and rear yards.

However, to give designers more freedom and allow for more efficient building shapes, heights may be averaged. To avoid overlong stretches of high wall, the regulations limit this averaging to a frontage length of 1½ times the width of the street in residential districts and twice the width of the street elsewhere.

A minimum angle is specified for low portions of buildings, to limit the amount by which a high portion may extend beyond the maximum angle of light obstruction. In residential districts, buildings may exceed the allotted average angle only along half the street frontage of the lot.

• **Daylight assured**—For windows that are needed to satisfy ventilation requirements of the city building code and the state's multiple-dwelling law, the proposed zoning law requires that they have around them a certain minimum amount of open space, called area-for-light access. This area is measured by a series of wedges, each of which is 10 ft long and subtends an angle of 10 deg at the center of the window.

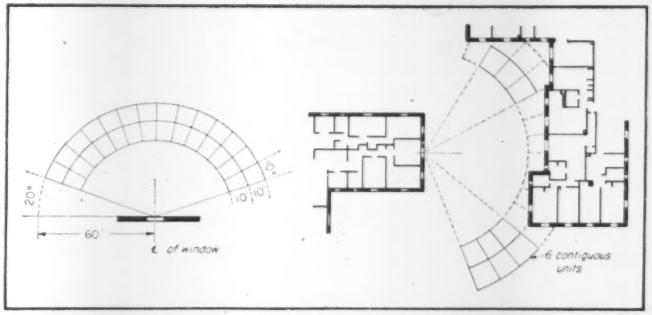
For residential buildings, the wedges are contained within a 20-ft-wide band, the outer edge of which is 60 ft from the window. Eight wedges, of which six must be contiguous, are required to be unobstructed by any portion of the building or a neighboring structure.

For low-bulk commercial buildings, the wedges are contained within a 20-ft wide band, the outer edge of which is 40 ft from the window. And again, eight wedges, of which six must be contiguous, are required to be unobstructed.

For high-bulk commercial and manufacturing buildings, the wedges are contained within a 10-ft-wide band, the outer edge of which is 20 ft from the center of the window. Eight wedges, all contiguous, must be unobstructed.

• **Open-space requirements**—The proposed zoning resolution also requires that in most parts of the city, owners of residential buildings must provide suitable outdoor space for recreation and drying yards, accessible to all tenants. The area of this space is proportional to the number of dwelling units and varies from one district to another. It may be provided at grade, and in more congested districts, on roofs or balconies.

Balcony space counts double. A dwelling unit with access to sufficient balcony space need not be included when computing the total open space required. This outright encouragement of balconies, the architects report, has already met with considerable criticism. Furthermore, some authorities believe that part of the usable space should be covered, to provide protection from the weather.



OPEN SPACE around windows will be assured by requiring a minimum area for light access, measured by a series of wedges in a circular band. For housing, eight wedges, six of them contiguous, must be unobstructed by neighboring structures.

• **Off-street parking**—The new law covers parking and loading facilities in great detail. Attempting to force building owners to do their share in relieving traffic congestion, it requires parking space and loading berths off streets in all but smaller buildings.

• **Controls indexed on map**—Under the present zoning resolution, every piece of property in the city is subject to three different types of control: Use districts, limiting the type of building permitted; height districts, controlling building height; and area districts, fixing the sizes of courts and yards. Each type of control is districted on a separate map.

This system has several disadvantages. Boundaries of the various districts seldom coincide. It is difficult to introduce new restrictions, such as parking requirements, that cannot be classified under use, height or area. And in spite of the rigidity of the requirements, the intentions of the law have been flouted architects claim.

The new zoning regulations, instead, offer a single-map system. Each district will have complete specifications of use, height, yards and other necessary limitations.

• **Conclusions**—In presenting their analysis to the public, the architects emphasize that:

1. An urgent need exists for a new approach to zoning in New York City.

2. Study of the problems has been carried out with thoroughness and intelligence by Harrison, Ballard and Allen.

3. Principles set forth in the proposed law rest on a practical and realistic base.

4. Better buildings will result, in that greater flexibility in planning is permitted.

5. Public interest will be better served than under present regulations by the new provisions for light and air, open space and vehicle storage.

Fixed-fee award left to N.J. courts

The Judiciary Committee of the New Jersey State Senate decided last week to follow a "hands-off" policy in a fight between contractors and the New Jersey Turnpike Authority over the awarding of a cost-plus-fixed-fee contract for construction of service buildings along the Authority's 118-mile toll road (ENR April 19, p. 29).

State Senator Harold W. Hannold, committee chairman, said that the committee felt the complaint by the Gumina Building & Construction Co., of New Brunswick, N. J., against the contract award "should be settled in the courts of the state."

The Gumina firm filed a protest with the committee after the Turnpike Authority rejected its low bid on the construction of an administration building, restaurants and service stations and awarded a $7,700,000 cost-plus-fixed-fee contract to August Arace & Son, Elizabeth, N. J., and A. A. LaFountain, Hackensack, N. J. for the work. Gumina was joined in the protest by the New Jersey Association of Master Plumbers and the Air Conditioning Contractors of North Jersey.

Paul L. Troast, chairman of the Turnpike Authority, contends that a state law prohibiting this type of contract does not apply to projects for the turnpike across the state.

BIDS AND BIDDERS

(Major project news received after Construction Reports, page 82, went to press.)

Generating stations—John Griffiths & Son Co., has been awarded a $20,000,000 contract for the construction of third and fourth units at Ridgeland Generating Station, Strickney, Ill., by the Commonwealth Edison Co., Chicago. Naess & Murphy, Chicago, are architects.

Nurses home and school—Depot Construction Corp., New York, N. Y. was low with a base bid of $9,432,000 on general contract Nurses School and Residence, Bellevue Hospital, New York, N. Y. Department of Public Works, City of New York, opened bids April 18.

Refinery—Sun Oil Company, Philadelphia, Pa. plans a $8,380,000 benzene plant and a $2,577,145 aviation gasoline plant at Marcus Hook, Pa. P. D. Barton, is chief engineer for company.

Tunnels—Dominion Steel & Coal Corp., Sydney, N. S., is taking bids for a 3,600 ft tunnel at Sydney, and a 10,000 ft tunnel at Glace Bay, both Nova Scotia. Total cost of projects is $10,000,000.

Schools—City of Stockton, Calif., will hold an election June 5 to vote $8,000,000 bonds for additional schools.

Housing—Acme Home Builders, Detroit, Mich., will construct a $20,000,000 residential development in Trenton, Mich., by own forces.

Bridge—Mississippi State Highway Commission, Jackson, Miss. will open bids June 5 for toll bridge over Bay St. Louis, on U. S. Highway, 90, Hancock County. Estimated cost is $8,400,000.

High pressure blower and test wing—Daniel J. Cronin, Inc., Newark, N. J. was low bidder at $6,580,000 for constructing high pressure blower and test wing, at Naval Aeronautical Test Laboratory, Trenton, N. J. The Bureau of Yards & Docks, Arlington, Va. opened bids April 25.

Power plant—Public Service Company of Oklahoma, Tulsa, plans a $15,000,000 steam plant near Chickasha, Okla.

Nurses residence—Hospital for Sick Children, Toronto, Ont., has awarded contract for superstructure of $10,000,000 hospital to Foundation Company of Ontario, Ltd., Toronto. H. H. Angus & Associates, Toronto and Wallace, Carruthers & Associates, Toronto, are engineers. Allward & Gouinlock, Toronto, are architects and Stone & Webster of Canada, Ltd., Toronto, is project manager.

Housing—Public Works Office, Sixth Naval District, Naval Base, S. C. will take bids May 23, to select a sponsor to construct and operate a housing project at Naval Air Station, Memphis, Tenn. Estimated cost is $4,136,675.

Water treatment plant—City of Houston, Tex., plans water treatment plant in connection with San Jacinto River Project. Estimated cost is $4,000,000. Freeze, Nichols & Turner, Houston, are engineers.

Bachelor housing—Haddock Engineers, Ltd., Seattle, Wash., has been awarded a $5,786,000 contract to build bachelor housing, service and recreation center at Whittier, Alaska, by the U. S. Engineers, Anchorage.

Residences—Allen B. Holmes Inc., Baltimore, Md., will construct a $6,000,000 residential development, at New Castle, Del. Work will be done by separate contracts. Julius Myerbert, Baltimore, Md., is architect.

Absorption plant—Tex-Harvey Gasoline Co., Midland, Tex., is taking bids for the construction of a high pressure absorption type gasoline plant. Project is estimated at $5,750,000.

Chemical plant—Celanese Corp. of America, Bishop, Tex., will build a 3,520,000 chemical plant by own forces at Bishop.

Refractory—W. E. Cook, Niles, O. has been awarded contract to construct a refractory at Warren, O., for the General Refractories Co., Philadelphia, Pa. Cost will be about $3,000,000.

Factory and office—Turner Construction Co., New York, N. Y. has been awarded contract for factory and office building at Hempstead, N. Y. cost is about $3,500,000. Alexander D. Crosett & Associates, New York, N. Y., are engineers.

Chemical plant—Hooker Electro-Chemical Co., Noagara Falls, N. Y., plans a $7,000,000 chemical plant at Manistee, Mich.

Apartments—Lewix Construction Co., Seattle, Wash., will construct eight apartment buildings at Anchorage, Alaska, by day labor. Estimated cost is $3,000,000.

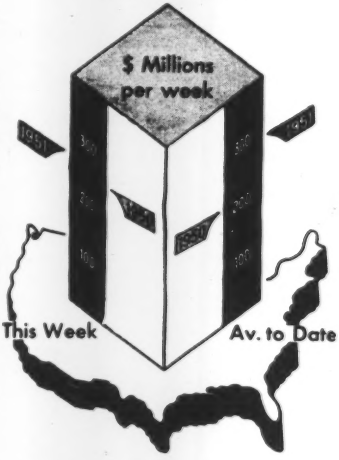
COSTS AND VOLUME

ENR INDEX NUMBERS

Index Base = 100	1913	1926	1949
Constr. Cost. Apr. '51	538.69	258.95	112.93
Bldg. Cost... Apr. '51	398.78	215.57	113.36
Volume ....Mar. '51	558	227	161

Activity This Week

As reported to ENR (in millions of dollars)



Amount of contracts let

	Week of May 3 '51	Cumulative 18 wks 1951	1950	% chge
Federal	$33.9	$797.1	$501.5	+59
State & Mun.	70.2	1,246.7	1,075.0	+16
Total Public	$104.1	$2,043.8	$1,576.5	+30
Total Private	166.5	3,224.6	2,154.3	+50
U. S. Total	$270.6	$5,286.4	$3,730.8	+42

Contracts by type of work

	This Week	Cumulative 18 wks 1951	1950	% chge
Waterworks .	$1.5	$81.0	$85.8	−6
Sewerage ...	7.0	112.1	82.2	+36
Bridges	11.9	102.0	112.2	−9
Highways ...	24.5	338.8	368.7	−8
Earthwork, Waterways .	2.3	208.1	134.8	+54
Buildings:				
Public	48.7	849.6	593.5	+43
Housg., pub.	5.0	188.6	76.7	+146
Housg., priv.	61.3	709.5	1,255.8	−44
Commercial.	8.3	227.1	333.5	−32
Industrial ..	80.3	1,899.7	376.0	+405
Unclassified .	19.8	551.9	311.6	+77

NOTE: Minimum size projects included are: Waterworks and waterway projects, $25,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $200,000.

New capital for construction

	Cumulative 18 wks 1951	1950	% chge
Corporate Securities	$675.5	$613.1	+11
Fed. loans, Priv. Constr.	0	0	0
State and Mun.:			
Excl. housing ...	732.4	644.2	+14
Housing	321.9	221.3	+45
Fed. Aid, non-fed. constr.	73.4	0	0
Total Non-Federal ..	$1,805.2	$1,478.6	+22
FEDERAL	2,602.5	0	0
Total Capital	$4,407.7	$1,478.6	+198

Clay pit to be dry dock for pier foundation boxes

Buoyant concrete boxes, the novel feature of foundation design for New York's fireproof Pier 57 (ENR Jan. 11, p. 46) will be built in an abandoned clay pit 35 mi up the Hudson River, near Haverstraw.

The pit formerly supplied a brick works. Now a lake 125 ft from the Hudson at the nearest point, the pit is 3,000 ft long, 1,000 ft wide.

Pier substructure contractors, Merritt-Chapman and Scott Corp. and Corbetta Const. Co. (both of New York), will pump 210 mg to dewater the pit, which then will be a "dry dock." On a leveled section of bottom the contractors will build three boxes, each to measure 350 x 82 ft in plan and 34 ft in depth.

When construction is complete, water from a channel breached to the river will flood the pit, float the boxes for towing to the pier site.

At the site, boxes will be sunk onto a prepared base, their tops beneath low water. A pier superstructure dead load is imposed. The boxes will be dewatered. When the job is complete, box buoyancy will counteract 90% of total pier dead weight.

Power development planned at six Klamath River sites

Application has been filed with the Oregon Hydroelectric Commission by the California-Oregon Power Co. for a permit to construct a power plant in the Klamath River canyon 7 mi from Keno, Ore.

The project, designated as Big Ben No. 2, would consist of a dam 310 ft long and 52 ft high, and a power house which would house two 25,000-kw generators.

Big Ben No. 2 would be the first of six plants which the company proposes to build in the Klamath River, which flows through southern Oregon and northern California. Others would be designated as Big Ben No. 1, Big Ben No. 3 and Scott Cave—all in Oregon—and Warm Springs and Iron Gate in California. Cost of the entire program would be about $50 million.

A recent opinion by Oregon Attorney General George Neuner paved the way for COPCO to undertake the projects. The company has had the program under consideration for a number of years, but a previous opinion by an Oregon attorney general held that the federal government had sole rights to Klamath River water. This barrier was removed by the later ruling in which it is held that the state has jurisdiction.

COLUMN COLLAPSE—About 2,000 sq ft of roof crashed to the ground, killing four workmen and injuring a fifth, when an exterior column gave way April 21 during construction of a 245,000 sq ft factory for Kraft Foods in Decatur, Ga. Reason for the collapse has not yet been determined. Structural members and roof slabs are built of precast concrete, construction being identical with that used at the Naval Supply Depot, Mechanicsburg, Pa (ENR April 18, 1946, vol. p. 546). The same designer—A. Amirikan—and the same contractor—Corbetta Construction Co.—collaborated on both jobs. Rigid frames, spanning 66 ft, are channel sections bolted together. (Wide World photo)

Millions for schools; loans cut asked

Grants of $46.5 million for 100 school construction projects in "federally-affected" local areas and on federal property have been approved by the Federal Security Agency, Office of Education.

Meanwhile, financial interests are studying a release by a committee of the Federal Reserve Board which virtually orders a tightening on loans for construction that does not tend to increase production essential to the defense program.

The grants for new schools represent roughly one-seventh of the number of requests for aid made to FSA for such aid. Funds are available under Public Law 815, which provides for federal aid in areas where government activities are responsible for greatly increased population pressures.

The Office of Education reported that in all 697 requests for aid had been received, for a total of more than $240 million worth of construction. Biggest reservations of federal funds included: $1.3 million for the Linda Vista area of San Diego, Calif.; $1.2 for School District 137, Rantoul, Ill.; $1.2 for Mad River, Ohio.

• **Not all justifiable?**—The Voluntary Credit Restraint Committee, an adjunct of the FRB, noted that industry at present is seeking $24 billion for new plant and equipment. Only about half of this sum could be justified as defense or defense-supporting, the committee said.

The report then suggested a three-point set of criteria for deferring action on loans. It said this could be used as a guide by banking interests.

Loans should be deferred, it said, on: Moves to improve the competitive position of an individual producer of non-essential goods; moves to expand or modernize businesses engaged in distribution or services where not defense-supporting; loans to improve plants engaged in manufacture of consumer goods not related to the war effort.

FRB added that some such a measure would have to be enforced as a preventive against greater inflation.

Heated ramps designed for Boston Central Artery

Nearly all of the ramps on the proposed Boston Central Artery (ENR April 20, 1950, p. 42) will be steam-heated below the surface to melt snow and ice, preventing winter traffic delays due to hazardous roadways, according to Massachusetts Public Roads Commissioner William F. Callahan.

This will be the first heated roadways designed for the state.

On the Central Artery, pipes will be laid under the surface and tied in with the Boston Edison Company's steam system. This is an interesting departure from the roadway heating employed on the ramps of the Port of New York Authority Bus Terminal in Manhattan (ENR Nov. 16, 1950, p. 11) where the heat piping is filled with a non-corrosive petroleum product which is circulated at 170° F by a heating plant integral with the bus terminal.

How to collect on unexpected subsurface difficulties

• Government agencies have let contracts based on superficial surveys. Here's an answer for contractors who find actual conditions far different from those on which they based their bids.

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CONTRACTORS engaged in performance of government contracts involving substantial quantities of excavation work face an increasingly important problem:

How to avoid loss when subsurface conditions actually encountered materially differ from those on which the bid was based.

It is common knowledge that government departments and agencies frequently let contracts involving vast quantities of excavation after having made only superficial field surveys based on a wholly inadequate number of subsurface borings.

Bidders seeking government work generally have no alternative but to accept as representative for the entire site the conditions revealed by these borings. Limitations upon time for opening of bids, quite independently of the cost, prohibit making independent and comprehensive surveys. In numerous instances the result has been that subsurface conditions were encountered which materially differed from those indicated by the drawings and specifications on which the bid was based.

There has but recently come to the writer's attention one such instance involving a large dam in the west, where only three borings were made in the entire foundation area, including the spillway structure. It subsequently developed that the site included innumerable rock faults which rendered the excavation most difficult and expensive.

Similar difficulties can, and frequently do, arise even where the contract drawings appear to contain an adequate boring log.

This is true particularly with respect to materials that appear to be sands and clays, when viewed as dry samples, but which in their natural state contain various cementing agents that give them some of the excavation characteristics of rock.

The potential difficulty of excavating such materials is hard to appraise from the samples yielded from wash borings. Result: They are often erroneously described in the boring log. The same is true with respect to the various types of hardpan, sandstone, and estuarine sediments. Similarly, government estimates of the quantities of excavation to be performed have frequently been far off, due to the urgency under which such estimates and the field surveys supporting them were made.

• Changed conditions clause—The means of preventing financial loss when confronted with such unexpected difficulties lie in the contractor's knowledge of what rights he may reasonably insist upon under his contract, and what steps he must take to avoid the forfeiture of these rights.

In the standard form of government construction contracts, there appears as Article 4 a provision relating to changed conditions.

In substance, this article provides that if the contractor should encounter (or the government discover) during the progress of the work, subsurface or latent conditions materially differing from those indicated by the drawings or specifications, the attention of the contracting officer shall be called to such conditions before they are disturbed.

If the contracting officer finds that such conditions are in fact materially different, the contract provides that he shall increase the contract price. The relief available to a contractor under the provision may extend even beyond a variation with the borings, drawings or specifications, so as to cover subsurface materials that differ materially from conditions ordinarily inhering in the type of work being performed.

This relief can also be obtained to cover situations where subsurface conditions have affected the accuracy of estimates of yardage to a contractor's disadvantage, or where subsurface conditions have caused a redesign of the work.

• Getting around it—A liberal interpretation of this standard contract provision would tend in some instances to disturb the departmental and administrative allocation of funds made for specific projects. So the departments—legally prohibited from deleting the provision from the standard form of contract—have occasionally attempted to nullify it by placing conflicting provisions in the specifications.

Such devices have been too numerous to discuss extensively here, but the following illustrates a few and the position that the United States Court of Claims has taken:

• Court says: No!—In a recent case involving the enlargement of an airfield, subsurface water and muck were encountered unexpectedly. The contractor sought relief under the changed-conditions clause of his contract. The government refused relief on the ground that the specifications provided that "unclassified excavation shall include the removal of all material encountered regardless of type and/or class of material."

Overruling this defense and permitting the contractor to recover, the Court of Claims said:

> **Government specifications usually contain provisions similar to the one above quoted . . . but the bidder has a right to take into consideration the information and data disclosed in the specifications and on the drawings and to read and reasonably interpret such provisions in the light of other provisions of the contract.**

In another case the quantity of excavation was estimated in the specifications to be 3,900,000 cu yd. Both the government and the contractor concluded that the ratio of 1,600,000 cu yd of cut and fill to 2,300,000 cu yd of borrow could be relied on to arrive at a composite price per yard for the total estimated yardage.

Although the contract contained the standard changed-conditions clause, the specifications, Section 1.05, stated:

"The estimate of quantities of work . . . is given only to serve as a basis for canvassing offers and for determining the approximate amount of the consideration of the contract."

When the estimated quantity of borrow was reduced by 750,000 yards

by action of the government (thereby affecting the ratio upon which the bid was based) the contractor claimed his loss. The government raised as a defense the specification provision which disclaimed responsibility for accuracy of the estimate except as a basis on which to canvass bids. Holding that this provision of the specifications did not nullify the changed conditions clause in the contract, the Court of Claims said:

> **The government relies heavily upon the provision in Section 1.05 of the specifications, which we have quoted above. This section is found in many government contracts, and it means that estimates made in invitations for bids for contracts which are to be paid for on a unit price basis are only estimates and not guaranteed amounts. But it certainly does not mean that Article 4 of the contract which promises modification of the contract to conform to unforeseen subsurface or latent conditions, "or unknown conditions of an unusual nature, differing materially from those ordinarily encountered . . ." is to be cancelled out of the contract. Neither does it mean that all considerations of equity and justice are to be disregarded, and that a contract to do a useful job for for the government is to be turned into a gambling transaction.**

• **And a building**—In another case, builders were asked to bid on the construction of a building. On the site was an existing structure to be removed by the government. Attached to the proposed construction contract for the new work was drawing X-1-A, which showed that the existing structure had a basement 300 x 28 ft. The specifications, however, provided:

> **3-2. Drawing No. X-1-A relating to conditions of the site is not a contract drawing. It is furnished bidders only for such use as they may choose to make of it. The accuracy of data given on this drawing is not guaranteed.**

After the work started, the contractor discovered that the existing structure did not have the large basement indicated by drawing X-1-A, and that considerable additional excavation would therefore be required. The contractor, accordingly, made claim for the cost of this excavation. In the Court of Claims the contractual disclaimer of any guarantee of drawing X-1-A was raised by the government. In permitting the contractor to recover, the court said:

> **We recognize that the language of the paragraph, "The accuracy of data given on this drawing is not guaranteed," is a pointed warning. Yet the statement on the drawing ought not to have been made at all if the one who made it had no knowledge of the facts. If, on the other hand, he made an examination and reached the same conclusion that Herfurth did, the discovery of the true situation would have been as unexpected to him as it was to Herfurth and plaintiff. If that is what happened, plaintiff would seem to be entitled to the relief contemplate by Article 4 of the contract, discussed hereinafter. Plaintiff's bid did not contemplate the necessity for excavation under a considerable part of the Supreme Realty Building. His omission was induced by the defendant's misleading drawing. We think the defendant should not gain such an advantage from its use of this drawing, and we conclude that plaintiff may recover the cost of the additional excavation.**

• **Decision not always followed**—It is to be pointed out, however, that the decisions of the United States Court of Claims—while carrying with them the full import of a judgment against the United States—are not always followed by the administrative departments. Where an executive department takes administrative action on a contract contrary to a precedent of the Court of Claims the contractor should carefully protect his rights. He should reserve the initiative to apply to this tribunal for relief if later circumstances render it desirable for him to do so.

However, strict observance by the contractor of all steps required by him under the contract, including the complete exhaustion of his administrative remedy before the executive department, are prerequisites to his right at a later time to seek redress in the Court of Claims.

• **Put it in writing**—In the standard form of construction contracts, the changed conditions clause appears under Article 4. The requirements of this article must be carefully noted, as well as the requirements of Article 15 of the contract relating to administrative appeals, for all of the steps mentioned in this article must be taken before liability can successfully be asserted in the court.

While the contract does not provide that notice of discovery of a changed condition must be in writing, it is often very wise to do so, thus obviating future disputes. The contractor should also advise the government, in writing, of his expectation to be paid for the additional cost of coping with such changed condition.

At this point, the contracting officer is obliged under the contract to investigate the condition. The contractor as a precautionary measure should utilize this interval of time to take photographs and collect other technical data then apparent and available, but which will be covered up as the work advances.

• **Get expert testimony**—Depending upon the size of the contract and the importance of the question involved, this is the interval when the technical assistance of those versed in the principles of soil mechanics and geology should be engaged. The later testimony of such experts, buttressed by their personal observation of the conditions encountered, has often proved to be of invaluable aid in this type of controversy.

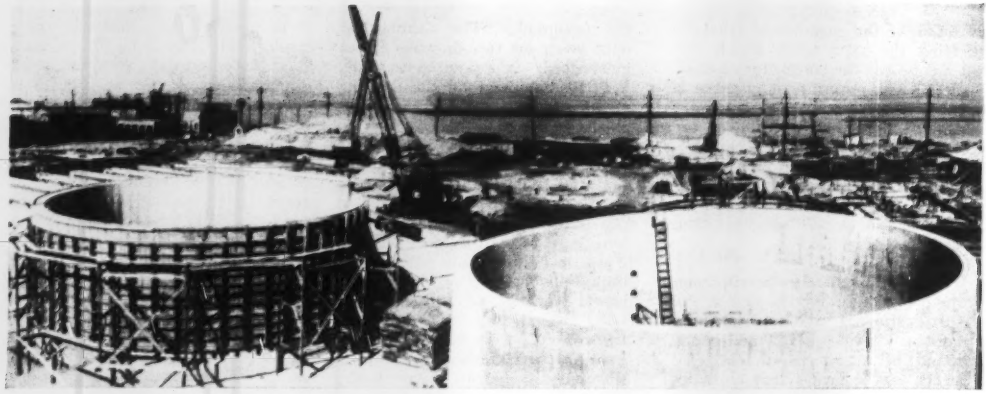
If the contracting officer decides that a changed condition does not exist his decision, under Article 15, becomes final unless the contractor appeals to the head of the department in writing within 30 days.

The contract provides that in the meantime the work shall proceed.

• **Procedure varies**—The appellate procedure initiated by the contractor's letter varies considerably in the different departments. In the Department of the Army and the Department of the Navy there are regularly established boards, whose function is to hear administrative appeals under contracts. They operate in a quasi-judicial manner, taking testimony of witnesses who are in some instances placed under oath. Witnesses are thus subjected to examination by the contractor's representatives and to cross examinations by the government representatives. After the presentation of all such "testimony," the case is argued before the board and at a later date a formal decision is rendered.

However, some departments observe no such formality. Once the written appeal is filed, the matter is decided on the basis of such written appeal, although a contractor is usually permitted to make oral statements in support of his appeal if he desires.

Which of the two methods is preferable has long been a matter of discussion. There appears very little question but that the formalized board procedure is conducive to a fuller and greater development of all of the facts. It should be noted in passing that the standard form of contract does not give any of these appellate boards the right to finally interpret the meaning of the plans and specifications in the absence of ambiguity.



50-FT DIA DIGESTER TANKS—Two of four in the present project—had been poured when this photo was taken at Rockaway Sewage Treatment Works. At far right behind tank, pump and powerhouse foundations emerge from the ground. Aeration tanks are behind tank at left. In background: Jamaica Bay. (ENR staff photos)

City and county attack pollution on Long Island's southern shore

Two sewage treatment plants—some ten miles apart—are under construction on Long Island's south shore to abate pollution of important recreational waters.

The larger is Nassau County's 54 mgd District No. 2 plant at Bay Park. It ultimately will serve some 500,000 people and protect waters offshore as well as valuable groundwater supplies within the areas served. Initial capacity is to be 27 mgd.

The smaller—just west in Queens County near the mouth of Jamaica Bay—is the 15-mgd. Rockaway works, smallest plant under construction by New York City's Department of Public Works in its present five-year drive to clean up city harbors and beaches.

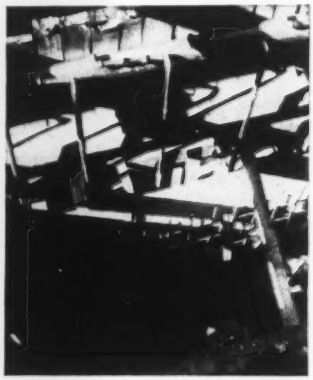
• **At Bay Park**—Nassau's near-completed plant, the 52 mi of gravity-flow trunk lines with their branches, and the 12,600-ft outfall from it make up $25,000,000 worth of work. The project is part of a master plan the County Sanitation Commission contemplated as early as 1936.

All plant structures are virtually finished, and the activated sludge treatment works is due to go into operation late this year.

The plant alone is a $7,500,000 job. Hendrickson Bros. (Valley Stream, N. Y.) are general contractors doing over $6,000,000 worth of the work. Excavation went to J. Rich Steers, Inc., and superstructure to Grove, Shepard, Wilson & Krug, both New York firms.

Plant structures rest on spread footings that were constructed behind dikes of mud dredged from the site. Wellpoints discharged up to 15,000 gpm to keep the work dry.

Pile-support was needed, however, for the 84-in. dia outfall and the substantial effluent chamber at its discharge end. The outlet structure, a 200-ton reinforced concrete box with discharge ports, was built on a barge near the site, then lowered into place by the floating derrick, Monarch, owned by the outfall-system contractor, Merritt-Chapman & Scott Corp., of New York. (ENR Mar. 8, p. 31).



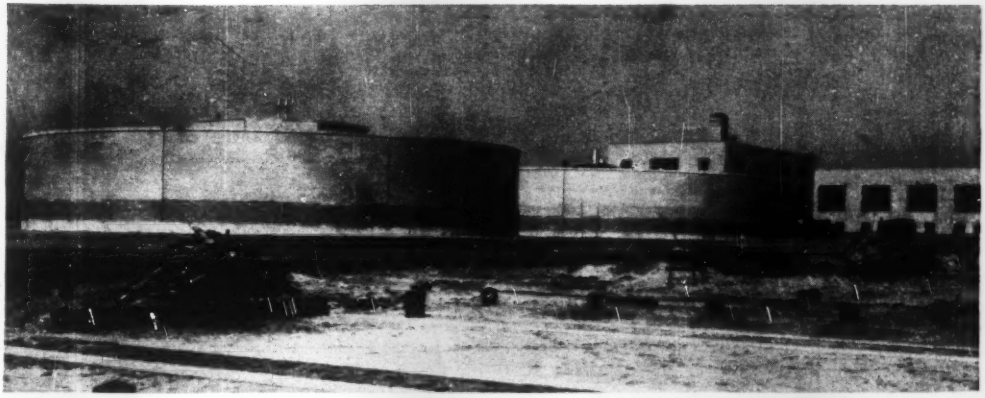
WELLPOINTS IN DEEP TRENCH permit constructing in the dry the intake of the Rockaway plant. Groundwater was depressed over 30 ft at the sandy bayside site.

• **Treatment facilities**—An 84-in. trunk sewer will feed the plant, through a bar screen and comminuter. Flow will be picked up by centrifugal pumps and sent on to grit chamber, preliminary settling, aeration, final settling, chlorination and discharge.

Electricity for motors that drive the pumps (and for all other uses at the plant) is to be generated in the pump and power house from dual fuel engines burning methane gas, derived in sludge digestion, and make-up fuel oil. There is to be a diesel stand-by generating unit.

Aeration tanks, where sewage is to get 4-hr step aeration activated sludge treatment, are equipped with swing-type diffusers capable of delivering 0.5 to 1.5 cu ft of air per gallon of sewage. Waste sludge, not returned to the aeration tanks, will go on to digesters, elutriation, vacuum filtration and drying—for final use as a soil conditioner on county-owned properties.

Greeley & Hansen, Chicago, designed the plant, and D. K. MacKenzie is supervising construction for them. J. C. Guibert is commissioner of public works for Nassau County, and R. H. Gould is its consulting engineer on this job. Richard Sennett is Hendrickson Bros.' superintendent. William Moulton is Merritt-Chapman & Scott's superintendent.



90-FT DIA DIGESTER TANKS—Four of them, all finished—await completion of the rest of the plant that later this year will begin treating sewage of Nassau County's southwest corner. In the foreground are sludge drying beds on which digested and vacuum filtered sludge will be dried for use as fertilizer.

• **At Rockaway**—On the bay side of the narrow peninsula separating Jamaica Bay from the Atlantic, New York's 33% completed Rockaway plant was, during its early stages, a near-ideal wellpoint job. Now, most of the project is out of the ground (see photo).

Not 300 ft from the bay and only 5 ft above mlw, the construction site had to be protected from water inflow after the groundwater table had been taken down from El. 0.0 to −31.3 at the pump and powerhouse. But the clean white beach sand that goes down far beyond that depth, made the dewatering relatively easy.

A 160x240-ft area was enclosed with headers ranging from 14 down to 8-in. dia for first stage dewatering of this deepest-foundation area. Risers, 1½-in. dia and 31 ft long, are spaced on 2-ft centers on one side of the area, 4-ft centers on the other three. It took only 15 seconds to jet a riser 31 ft into the sand—even though it was wet—using a 225-psi pressure jet pump.

Groundwater was depressed as far as El. −15.0 with the stage one wellpoint set-up. Then a 2½-yd dragline was used to excavate to that depth. Next, a 60x135-ft area within the excavation was enclosed in 30-ft steel sheet piling driven full length to El. −45.0.

Second-stage wellpoints were sunk just outside this cofferdam with header and pumps at El. −15.0 and points on 2-ft centers all around. Excavation down to El. −30.0 was then done by clamshell—in the dry all the way.

Wellpoints also were used to dewater excavation for the digester, aeration and sedimentation tanks. And they are still in use in the trench work being done to bring a 66-in. interceptor line into the plant.

• **Delivery and treatment**—Five miles of interceptors will bring sewage to the plant from 90,000 persons living on 4,736 acres in the plant's drainage area. (Plans include future doubled capacity, to 30 mgd, to accommodate 180,000 population predicted for 1970.)

Treatment is by high-rate activated sludge process with sludge digestion and use of collected gases as fuel in generating operating power. Chlorinated effluent will discharge to Jamaica Bay through a 60-in. outfall. Digested sludge will, as at other New York City plants, be stored temporarily, then be pumped to a tanker for disposal 10 miles out at sea.

Project cost, including the interceptor sewer, is given as $5,700,000, of which $3,249,000 is for the prime construction contract held by Merritt-Chapman & Scott Corp., New York.

For the contractor: Norman Eastwood is project manager; John Hogan is superintendent. Charles Cousens is resident engineer for the city's Department of Public Works, of which R. H. Gould is director of the division of sewage disposal and Frederick H. Zurmuhlen is commissioner. Metcalf & Eddy, Boston, did the design.

Concrete prestressed in tension

Big savings in concrete and steel may be achieved by prestressing concrete columns and arches. The dead load carried by these compression members can be neutralized by applying tensile forces in advance of, or simultaneous with, the assumption of dead load by these members.

This suggestion was advanced by Kurt Billig, professor of engineering, Hong Kong University, in CIVIL ENGINEERING AND PUBLIC WORKS REVIEW (London), Feb., 1951. This type of prestressing is the reverse of the type usually used, in which concrete beams are compressed in advance of the application of loads.

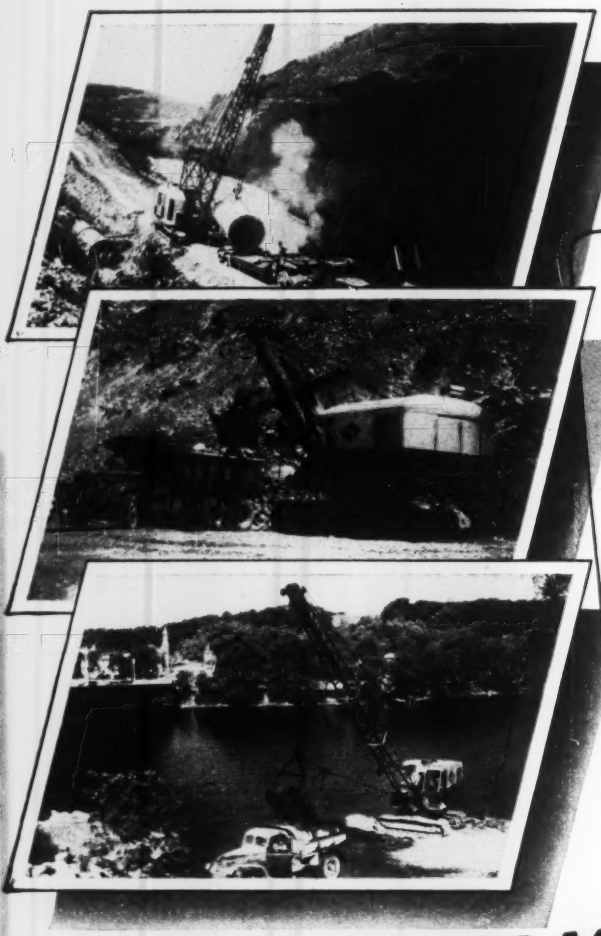
In Professor Billig's method, the prestressing member is a steel strut. It is put in compression by attaching to its ends a steel cable that is under high tension. The strut is embedded in the column. After the concrete has attained sufficient strength, the cable is detached, the strut tends to expand, putting tension in the column.

Professor Billig claims the following advantages for this technique:

Dead weight is carried by the steel; the concrete need be designed only for live load, and the section, therefore, is considerably smaller than for ordinary reinforced concrete. Ordinary concrete may be used, but high-strength is preferable. Working stresses for concrete do not differ from those used for ordinary reinforced concrete.

High-strength steel may be used with very high working stresses. Strains occurring in the completed structure are of the same order as for ordinary reinforced concrete.

Thus reduction in cross section of an axially loaded column may be to 50% or more, the saving in weight of steel may be 80% or more.



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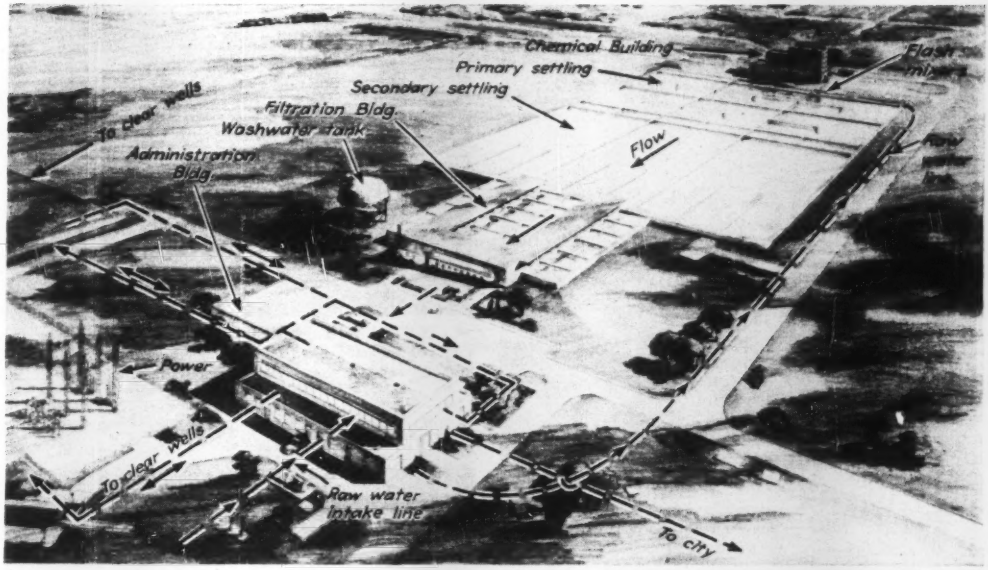


By rushing completion of a 96-mgd filter plant and developing sources of supply . . .

Dallas is winning its battle for water

EVERYTHING GROWS IN TEXAS; especially Dallas. During the past ten years its population has jumped from 298,000 to 438,000. Keeping one jump ahead of the water needs of this growing population has been an uphill fight for the city's water department. But if Dallas gets by this summer it shouldn't have a water shortage for the next 50 years.

By fall, the new 96-mgd Elm Fork filtration plant will be completed—bringing the city's total treatment capacity up to nearly six times what it was 20 years ago. This capacity is expected to be adequate only until 1960, but the new plant is designed for orderly expansion to three times its present size without disrupting service. Such an ultimate expansion to 288 mgd, plus the present 100-mgd filtration plant, is deemed adequate for all possible needs until the year 2000.

• Three plant-expansions to date—In 1930, Dallas built a 32-mgd filtration plant—the Bachman Plant—located in the northwest corner of the present city limits, on Elm Fork, a tributary of the Trinity River. But Dallas grew so fast that within six years the plant had to be expanded. Enlargement of the plant in 1936 boosted its capacity to 48-mgd, and another expansion in 1948 brought its rated capacity up to 64-mgd. This plant is currently operated at 100-mgd; the limit imposed by its hydraulic capacity.

At the time of the third expansion it was known that demand would soon overtake the supply. But the old Bachman plant couldn't be enlarged further, due both to economy of construction and a restricted site area. Consequently, the new Elm Fork plant was designed in 1949, contracts were awarded last year and initial operation is expected to be started by July. Full plant operation is scheduled for October of this year.

• Financing used to be easy—It hasn't been too difficult in the past to finance additions or new plant. Bond issues were approved and general obligation bonds were sold by the water department as funds were needed. In 1946 the city borrowed $10,000,000 on 10-year revenue bonds. Due to its conservative debt limitation, the city generally has had to pay less than 2¼% interest on its water bonds.

Today, however, the city is nearing its $75,000,000 bonded indebtedness limit—increased $25,000,000 only last year—and can't sell any more bonds, even though they have been authorized. It will take a charter amendment to raise the debt limit, but a favorable vote on this issue is expected at the general election this fall.

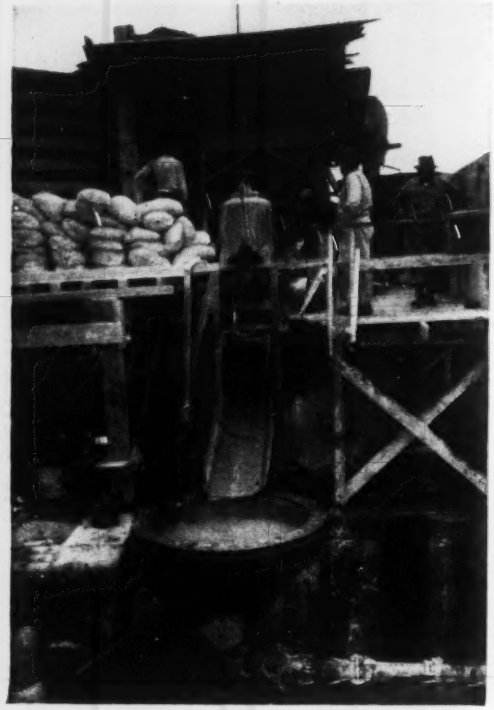
The water department, which also operates the sanitary sewage system, pays all of its net income into the city's sinking fund. Last fiscal year (ending September 30, 1950) this payment was $3,800,000.

• Need higher rates—But the immediate future prospects aren't so bright: Additional storage and distribution facilities must be started this year. Despite estimated revenues this year of $7,700,000, the water department expects to be $690,000 "in the red" by September 30, 1952. All this adds up to the fact that water rates must be increased; it is hoped this can be done by the end of next year.

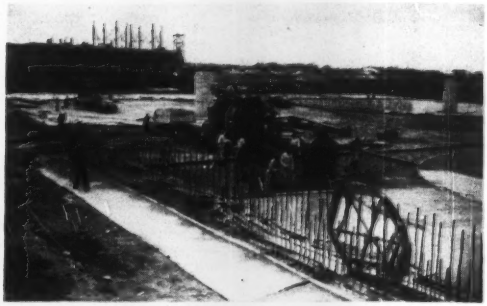
Currently, Dallas charges its domestic water consumers a minimum of $1.25 per month for the first 2,000 gal; ranging up to $4.48 for 10,000 gal. These charges also include sanitary sewage disposal.

• No threat of pollution—The water department located its new plant 9 miles upstream from the present one; just below the confluence of Elm Fork and Denton Creek. This site is above the flood plain of the Trinity River Valley. The valley between the two plants is becoming rather thickly populated, but above the new plant the watershed is chiefly agricultural.

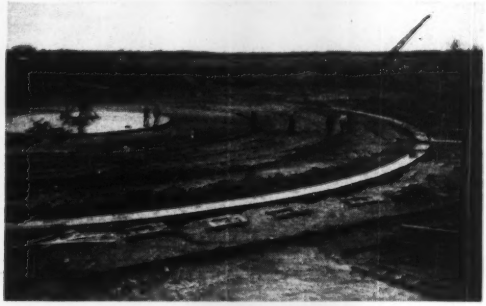
For the present, the city's entire



FILTER BUILDING—Concrete is pumped into place through 7-in. line by concrete pump located in pit below batching and mixing plant. Air entrained cement was used here.



SETTLING-BASIN FLOORS—Concrete is placed directly on prepared subgrade by 27E paver; chemical building (far background) uses 10-S mixer, materials hoist, and buggies for placing.



CIRCULAR CLEARWELLS of prestressed concrete and thin-shell dome roof will store 14 mg of filtered water. Mule-team and slip (far background) perform fine grading of foundation.

water supply is impounded in Garza Reservoir (Lake Dallas) on Elm Fork 30 mi upstream from the old plant. Water is released from the reservoir, flows down Elm Fork and is picked up at the old plant. Average hardness of the raw water is 155 ppm, softened to 60 ppm by adding about 800 lb of lime per million gallons. The new plant will be served in the same way as the old; a small channel dam across the stream.

Should the stream between the two plants become too polluted, it may be necessary to pipe water from the channel dam down to the old plant. An added incentive for piping the water would be conservation, since considerable is lost through seepage and evaporation. Such precautions, however, are not likely to be necessary for several years.

• Long-range water supply — Along with enlarging its treatment facilities, the city has a long-range program for developing sufficient water storage to weather a five-year drought. Dallas still remembers the drought of 1908-13; at the height of which water mains were used only for fire protection. Tank wagons furnished the domestic supply. Precipitation during this five-year period totaled only 120 in.—a departure of 48-in. from normal for the five years. Moreover, distribution of the rainfall was such that run-off just about balanced evaporation.

As part of its long-range water supply program, the city is participating with the Corps of Engineers in the cost of two flood control dams, by paying for the incremental cost of conservation storage behind the dams. The city's share of the total $38,300,000 cost of the two projects is $5,000,000. The Garza-Little Elm reservoir, which will incorporate existing Lake Dallas, will store 415,000 acre-ft of water for Dallas. It is scheduled for completion in 1954. Grapevine Reservoir, scheduled for completion next year, will store 85,000 acre-ft.

When both reservoir projects are finished, they will supply a total of 500,000 acre-ft of water for Dallas; enough for a 5-years supply even for the anticipated growth in population during the next 50 years.

• Experience pays off—After having gone through the expensive and laborious job of enlarging its old plant three times, the water department saw to it that its new plant can be enlarged in orderly fashion without interrupting service.

First, they bought 127 acres of land to provide plenty of space for future expansion. Then they laid out a plan for the $6,000,000 plant—using a straight-line flow from chemical building to clearwells—that can be enlarged simply by duplicating existing facilities.

Raw water will flow through 6,000 ft of twin 72-in. reinforced concrete gravity lines from the channel dam to the raw water sump in the pumphouse at the new plant.

• Gravity flow through plant—Low-lift pumps—three 30-mgd to be installed initially, with provisions for adding three more—will lift the water 50 ft to the mixing chamber in front of the chemical building. From there it will flow back through the plant by gravity.

After chemicals have been added in the flash mixer, at 30-sec detention, the water will pass through distribution troughs into flocculators for 20 to 30-min detention; then into the

primary settling basins for 2-hr detention; to secondary settling basins for 3-hr detention; over weirs into collection troughs and to the rapid sand filters; and finally, to clearwells and the high pressure pumps.

Both the low-pressure and high-pressure pumps will be in the one pumping station. Provisions are also made for additional mixing and flocculation to give secondary coagulation ahead of secondary settling at such times of the year as it is needed. The plant also will furnish post-chlorination together with post-ammoniation, with provision of pre-chlorination if needed.

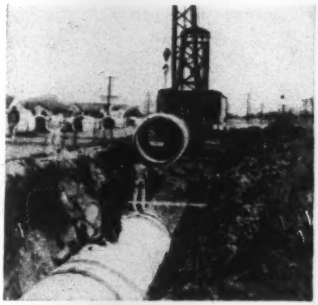
The chemical house will be five stories maximum height, equipped for automatic handling, storage, weighing and feeding the chemical into the flash mixers. Initially there will be four 160x160-ft primary and four 200x160-ft secondary settling basins, with 16½-ft water depth. Two additional primary and two secondary basins will be added to bring the plant to its rated capacity of 96 mgd. The primary basins are designed for cross-flow instead of center-feed.

The rate of sludge removal from the settling basins will be measured by weirs installed in one wall, to control density of the sludge and to measure the amount of water wasted. The sludge will be pumped to gravelly-bottom lagoons on a nearby 50-acre site purchased by the city. Eventually the water will return to the river.

All 24 filter basins are 43x37 ft; each designed for 4 mgd at 2 gal per sq ft. per minute. Filter troughs of reinforced concrete are flat-bottom for easy forming and washing. All piping, underdrains and rate-of-flow control are designed for 4 gal per sq in. of filter surface, per minute. There will be four prestressed concrete clearwells of 14 mg total capacity, covered with thin-shell dome roofs. They will be interconnected to each other and to the high service pumps. Two 30-mgd and one 20-mgd high service pumps will pump the treated and filtered water through 29,200 ft of 66-in. and 19,400 ft of 54-in. composite steel-cylinder and reinforced concrete pipe, under 100- to 110-psi pressure, to an existing pumping station in the city's distribution system. The plant will be served by a 500,000-gal elevated wash-water tank.

• Two electric power services—Electric power for operating the plant will come from two commercial circuits; either of which will automatically cut in if the other suffers a power failure.

Two 13,000-kva transformers will step the incoming power down from 67,500 v to 4,160 v for operation of the 1,750-hp, 4,160-v synchronous high service motors, and the 5,000-v switchgear. Other transformers will step this power down to 480-v for the low lift motors and plant service, while still other transformers will reduce it further to 120-v for small motors and plant lighting.



LIFE LINE TO DALLAS—5.5 miles of 66-in. and 3.7 miles of 54-in. lock-joint type concrete cylinder pressure pipe. Photo: Gifford-Hill-American, Inc., Dallas

• Four methods of concreting—The plant is reinforced concrete construction, with the concrete being placed by four different methods. Concrete in the chemical house is mixed in a 10-S mixer, hoisted by a materials elevator and buggied into place.

Floor slabs of the settling basins are placed directly on the compacted sand foundation with 27E concrete pavers; with the final ¾-in. grout surface being struck to grade by the revolving sludge-collecting mechanism.

Concrete in the walls of the settling basins—the tops of which are virtually level with the surrounding undisturbed ground—is mixed in a 27E paver and deposited in place by a 30-ft length of endless belt conveyor cantilevered out from the front of the paver.

Concrete in the filter building and pumphouse is pumped into the forms, and it probably will be pumped in place for the clearwells. Air-entrained cement was used in the pumped concrete.

Walls of the settling basin were poured full-height of 14 ft 3 in., in 60-ft long sections, inside steel plate forms backed up with welded channels. These same forms will be bent cold to a 185-ft radius for forming the walls of the clearwells.

• Some construction delays—There have been no changes in design plans due to shortages of materials, although there have been brief delays due to occasional shortages of reinforcing steel and cement. Completion of the high service water lines, scheduled for July, may be delayed until September due to slow deliveries of the 3/16-in. sheet steel forming the cylinders.

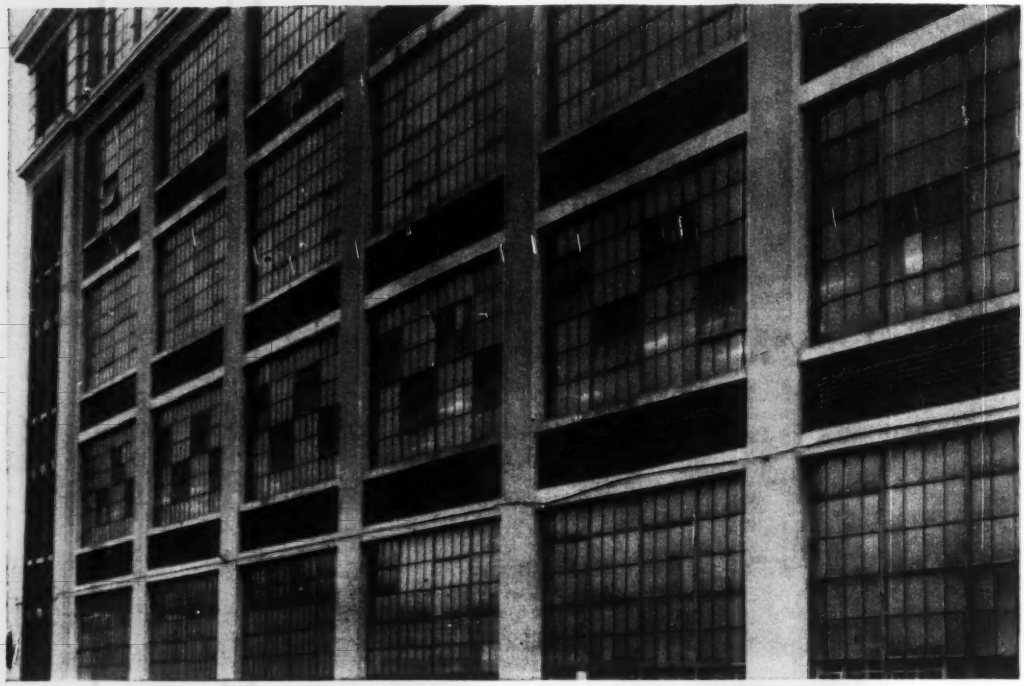
There also is a threatened delay in securing hydraulic valves due to the present inability to get bronze liners and valves for the hydraulic cylinders; also bronze stems for sluice gates. Fortunately, the pumps, motors and switchgear were purchased early.

• Additional improvements—Other construction planned for completion this year includes: a 2-mg elevated storage tank; a 10-mg concrete underground reservoir; a $200,000 booster station and $1,200,000 of additions to the distribution system. A 20-mg underground storage reservoir is planned for construction next year. Last year the water department installed 10 miles of distribution and feeder mains at a total cost of $2,750,000.

• Men in charge—Designs, detailed plans and specifications for the new 96-mgd Elm Fork water plant were prepared by Myers & Noyes and Associates, Dallas, based on requirements of the Dallas Water Department. Karl F. Hoefle is superintendent of the water department, under Charles C. Ford, city manager. Henry C. Graeser is assistant superintendent of water, L. W. Cumber is resident engineer.

CONTRACTS AND CONTRACTORS—DALLAS FILTRATION PLANT

Contract	Amount	Contractor	Field Superintendent
Intake line & structure	$497,100	Whittle Const. Co., Dallas	C. F. Coke
Chemical house	737,100	J. W. Bateson Co., Dallas	Johny Roberts
Settling basins & underground piping	2,089,000	W. G. Cullum & Co. and Whittle Const. Co., Dallas	Geo. Cason
Filters & filter building	1,339,000	Jas. C. Williams, Dallas	W. C. Smith
Pumping plant	877,000	E. E. Farrow Co., Dallas	Carol Southwell
Pumps, motors & switchgear	267,600	Alliger & Sears, Houston	H. O. Sears
Wash water tank	73,900	Pittsburgh-Des Moines Steel Co., Pittsburgh	R. D. Lawson
Railroad spur tracks	44,200	W. H. Nichols & Co., Dallas	H. H. Miller
Water main	2,137,200	Cole Williams, Inc., Dallas	Dub Williams
Total	$8,062,100		



30-year-old Fenestra Galvanized Steel Windows in American Woolen Company's Mill No. 2, Shawsheen, Mass. No sign of rust—yet they've never been painted.

No Rust—Even After 30 Years

(and these steel windows have never been painted!)

These are Fenestra* Galvanized Windows—"old style". They've served this building since Harding was President and although there are many signs of time in the picture above—there's not a sign of *rust.* There *is* no rust—even after 30 years.

And these windows were never painted.

But here's the really *big* news! *Now* Fenestra Engineers have developed a hot-dip galvanizing system that does *an even better* job—and they've built a special new plant around it, the only plant of its kind in the country. It has special tanks, special automatic controls—everything especially designed to give you the most *permanent* windows made.

Galvanizing is done *after* assembly of window frames and assembly of ventilators (and after cleaning, rinsing, fluxing and drying)—so that every bit of exposed metal gets a locked-on protective coating. To make sure the zinc coating is uniform, windows are hung from a unique conveyor that lowers to completely immerse them in molten zinc in one deep dip. Then withdraws them at controlled speed. Then they dip into the Bonderizing tank. Bonderizing gives them an attractive appearance and prepares the surface if you wish to paint them for decorative purposes.

Check on these windows today. *Steel-strong windows made to STAY new* put real meaning in the term "maintenance free"!

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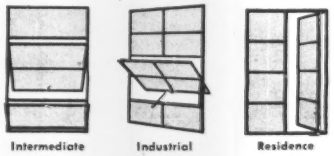
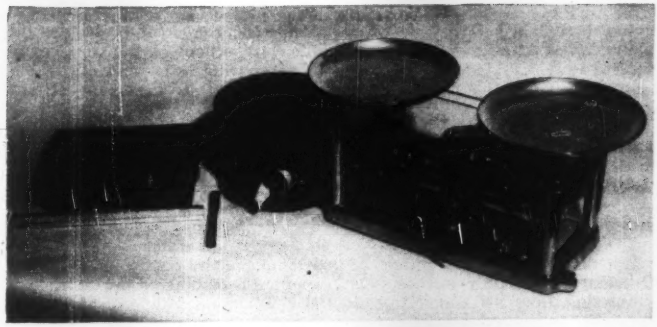


Intermediate Industrial Residence



PRACTICAL TESTING for soil moisture content is accomplished with four apparatus items: Bread pan, spatula, hot plate and torsion balance.

Compaction control for earth fills made easier by rapid moisture test

Donald Zwerski and L. D. Graves
University of Notre Dame
Notre Dame, Indiana

SOIL MOISTURE CONTENT, accurate within one percent, can be obtained in fifteen minutes by high-temperature evaporation.

The method is simple, the equipment rugged. Coupled with speed, these advantages bring scientific control of embankment materials within practical reach of the smallest earth-fill compaction job.

• **Answers long-felt need**—The need for a quick means of obtaining the moisture content of a soil has been felt since the beginning of modern soil mechanics in the late 1920's.

The application of soil mechanics principles to the compaction of earth fills, beginning in the early 1930's, intensified the need and started many investigations to develop a practical method of determining soil-moisture content in a few minutes instead of the hours necessary for the ordinary oven drying at 105 deg C.

Among such investigations were those of Bouyoucos, who in 1931 used alcohol to dissolve the water and then measured the change in the specific gravity of the alcohol to determine the amount of water. This method worked well if complete dispersion of the soil was obtained, but the time involved was about half an hour. Moreover, glass beakers, delicate hydrometers and highly volatile solvents did not fit conditions on the usual construction job.

Other methods have been tried since, but the impracticality, inaccuracy or lack of speed for all of these so-called rapid soil moisture measuring methods caused the authors to decide that a good method still was needed, and further investigation was warranted.

• **Higher temperature tried**—The most feasible method for investigation appeared to be one advanced by one of the authors about ten years ago and used on some construction projects where only granular soils were encountered. Based on the well-known principle of drying aggregates by high temperatures, the method decided upon was to dry the soil sample by spreading a thin layer of soil in a pan, applying direct heat while keeping the sample stirred, and determining the water content by weighing the sample before and after drying.

It was realized that such a method would be inaccurate for soils high in humus (such as peat and top soil), but those soils are not used in engineering construction.

The equipment consisted of a sheet-steel bread pan 7x9x2.5 in., a spatula, an electric hot plate, and a torsion balance with an accuracy of 0.1 gram. Sample size was 100 grams, since that is the smallest sample practical for field use. Each sample was pulverized by hand, weighed in the pan and heated by the hot plate at the given temperature for the given time. The sample was stirred constantly with the spatula.

After heating, each sample was re-

SOIL MOISTURE CONTENTS

Soil Type	Hot Plate Method				Standard Oven Method
	Time of heat. (min.)	Weight sample (gm.)	Temp.* (deg. F)	Water Content (%)	Water Content (%)
Sandy soils easily pulverized	30	100	375	15.0	14.4
	30	100	375	16.3	15.1
	25	100	375	9.3	7.8
	15	100	375	14.8	13.2
	10	100	375	12.5	11.1
	8	100	375	7.9	7.1
	6	100	375	7.6	7.1
	4	100	375	12.6	13.0
	4	100	375	8.9	8.7
	4	100	375	16.0	16.5
	4	100	375	16.5	17.1
	4	100	500	14.7	13.5
	4	200	375	15.5	21.4
Plastic soils not easily pulverized	4	200	375	14.6	17.7
	4	200	375	12.6	13.5
	30	100	375	15.0	14.4
	30	100	375	14.7	11.5
	30	100	375	23.8	21.1
	10	100	375	22.5	20.6
	7	100	375	19.2	18.8
	5	100	375	26.6	27.4
	4	100	375	22.2	25.4
	4	100	375	18.5	21.6
	4	100	500	22.4	23.8
Top soils	30	100	375	20.6	15.2 (Sandy)
	25	100	375	10.8	7.0 (Sandy)
	10	100	375	12.3	4.8 (Sandy)
	7	100	375	10.6	7.3 (Sandy)
	4	100	375	3.9	3.3 (Sandy)
	4	100	375	27.6	23.5 (Plastic)
	4	100	375	62.7	110.0 (Peat)
	4	100	375	21.8	20.1 (Plastic)

*0.5 in. above hot plate

moved from the hot plate and cooled in the air until the pan was cool enough to be handled with the bare hand. The sample then was weighed in the pan again.

With the weight of the pan known, the moisture content could be calculated.

A check was made by the standard oven drying method for each of the samples run on the hot plate.

• **Accuracy shown**—Results of the study are shown in the table. These results show that drying on a hot plate can be used to determine the moisture content of sandy soils with an accuracy of one percent of standard over a time range of four to eight minutes when a 100-gram sample and a temperature of 375 deg F are used.

It also is indicated that higher temperatures would require less time and larger samples more time.

• **Plastic soils**—The moisture content of plastic soils also can be determined over a time range of five to seven minutes when a 100-gram sample and a temperature of 375 deg F are used, and it is indicated that a higher temperature dries more moisture in a given time. The moisture content of peats and top soils cannot usually be determined by heating on a hot plate, although the method might be successful on a very sandy top soil with little humus.

• **Test time 15 min.**—The authors believe that the hot-plate method, with a total time from wet sample to complete moisture content of about 15 minutes, is the shortest feasible method ever proposed. Its accuracy is good enough for field use. Its equipment is simple, rugged, easily available, and can be used on construction jobs by engineers unskilled in laboratory techniques. In short, it is a practical method for practical engineers to allow them to control compaction of soils in the field by a quick check of moisture content and dry density.

Notes on legal decisions

Summaries of decisions relating to construction work prepared by I. Vernon Werbin, counselor at law and engineer, New York, author of Legal Phases of Construction Contracts (McGraw-Hill Book Co.)

Fraud by engineers

A construction contract provided that the engineer's approval shall be final as to the amount of work done and materials furnished in the performance of the contract, and also, that the determination and estimate of the engineer shall be a condition precedent to the right of the contractor to receive any money under the contract.

The work to be performed under the contract was to be paid for on the basis of unit prices. One of the items of work to be done was gunite repair work. The preliminary estimate of the engineer indicated that 2,400 sq ft of gunite repair work would have to be performed under the contract. The plans and specifications did not stipulate that a fixed amount of this class of work would be required, but only specified that a particular area was to be covered by gunite lining.

The actual performance of the contract required the doing of 5,150 sq ft of gunite lining repair work. The city engineer, in his final estimate, refused to include all the work done, but limited the estimate to the 2,400 sq ft set forth in the priliminary estimate. The contractor then brought an action to recover on the basis of the contract unit price for the gunite lining work in excess of the amount set forth in the preliminary estimate. The court allowed the contractor a recovery.[1]

The court in its opinion stated: "The construction of a contract is a question of law for the court. In construing a contract the intention of the parties should be ascertained and given effect if consistent with legal principles. To determine the intent of the parties to an ambiguous construction contract, the plans and specifications, the published notice to bidders, the bid of the contractor, as well as the language of the contract, should be examined. It was the intent of the parties to this action that the contractor, plaintiff, should be paid on a unit price basis for work performed."[2]

The court in its opinion stated further: "The engineer's original estimates were not intended to be conclusive as to the amount of work to be done. A clause in the instructions to bidders, in part, reads: 'The engineer's estimate of quantities as shown on the plans is approximate only . . . . and shall not be construed by the bidders as the actual quantity that may be required for the completion of the proposed work.'

"A section in the general conditions of the contract provides: 'The division into items has been made to enable the contractor to bid on the different portions of the work in accordance with his estimate of the unit cost, so that in the event of any increase or decrease in the quantity of any particular kind of work, the actual quantities executed may be paid for at the unit price bid for that particular kind of work.'

"If parties to a construction contract designate an engineer as arbiter of amount and character of work done and amount due contractor, engineer's approval is binding on the parties, but may be avoided upon showing of actual fraud or gross mistake constituting constructive fraud.[3]

"The non-approval by the defendant's engineer of gunite repair work completed within the provisions of the plans and specifications, without evidence of defective workmanship or materials, is constructive fraud; hence it is not a condition precedent to plaintiff's right to payment for that work."

(1) Lippert Bros., Inc. v City of Atoka, 94 F. Supp. 630 (United States District Court, E. D. Oklahoma, Dec. 9, 1950.)
(2) City of Hobart v Daily, 170 Okl. 107, 39 P. 2d 44.
(3) City of Lawton v Sherman Machine & Iron Works, 182 Okl. 254, 77 P. 2d 567.

Written orders for extras

A contract provided that when the contractor believes that instructions he receives will require extra work entailing extra cost he shall, within five days after the receipt of the instructions and in any event before proceeding to execute the work, file with the owner written notice of his intention to make a claim for extra compensation. It also provided that if the contractor shall claim any damage by reason of any act or omission on the part of the owner or of any other persons, for any reason whatever, he must, within five days after such claim has arisen, file with the owner, a written notice of his intention to make such claim. The contract further provided that the filing of a notice of claim within the time so limited shall be a condition precedent to the settlement of any claim or the right to appeal to arbitration or to resort to any other remedy. The contractor's failure to file a notice of claim within the time limited shall be deemed a conclusive determination on his part that he has no claim and a waiver of all claims for additional compensation or for damages.

The court held that under the above contract provisions, the failure to file written notices of claims, as required by the provisions of the contract, barred any claims for damages or for extra work.[1]

(1) Lenmare Const. Co. v New York City Housing Authority, 100 N.Y.S. 2d 321 (Supreme Court, New York, Nov. 3, 1950).

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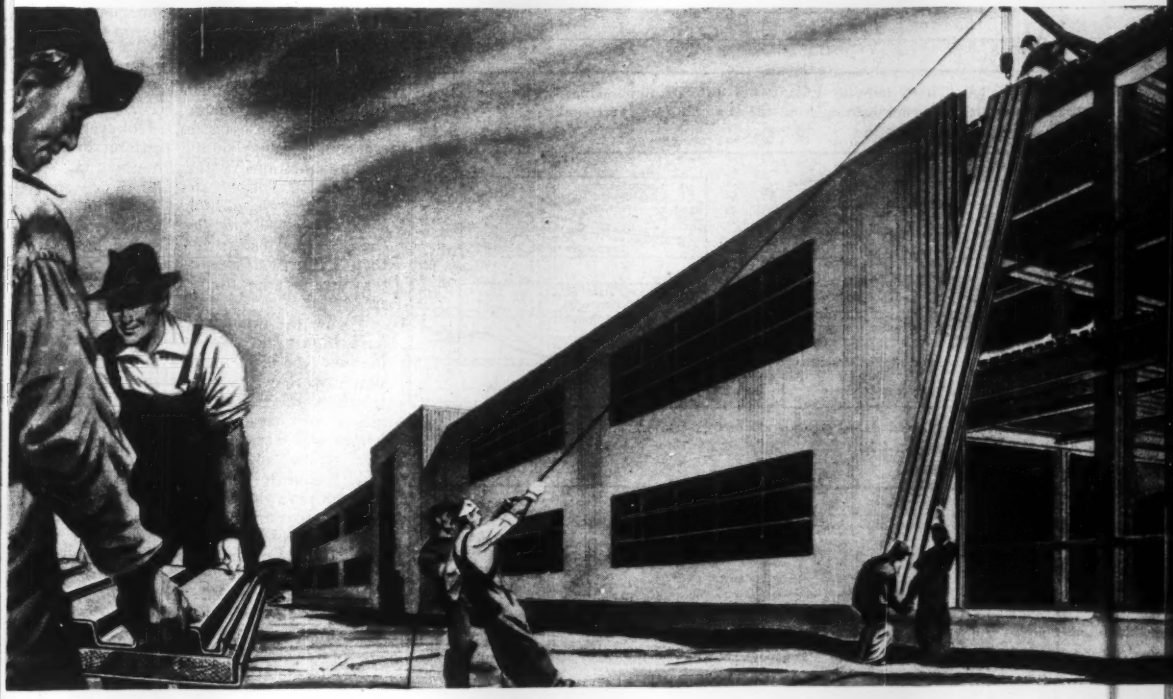

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How to compute illumination distribution

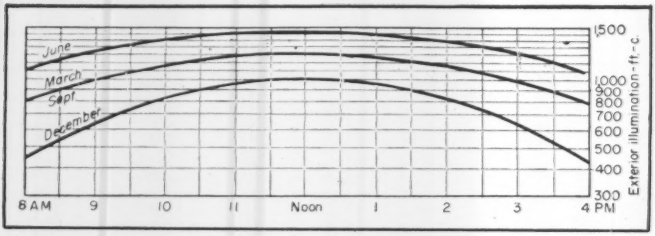
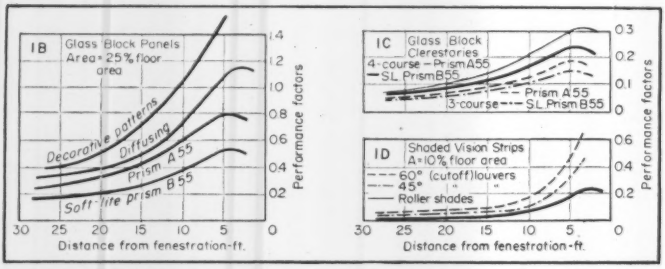


CHART 1A—Curves indicate variation of exterior illumination with time of day throughout the year for lighting from the sky only (no direct sunlight).



CHARTS 1B, 1C and 1D—Performance factors for sky light only. These values are needed for Scale C in Chart 2.

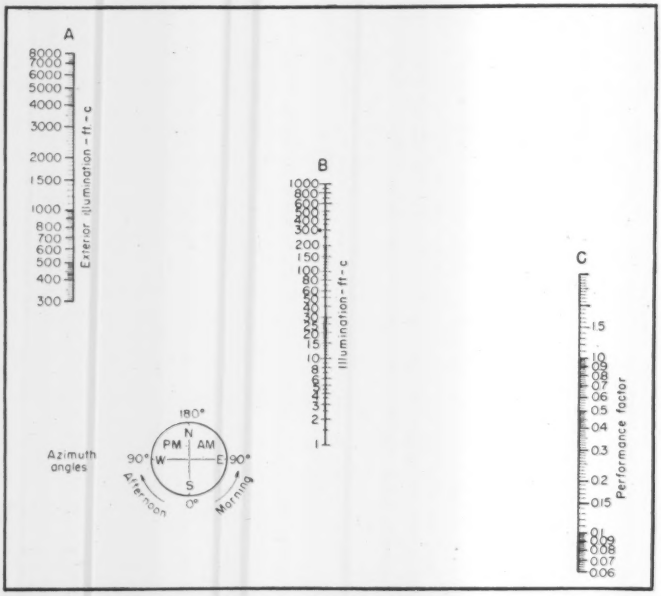


CHART 2—Nomograph enables illumination distribution to be estimated. Intersection of a straight line drawn between values on Scales A and C with Scale B gives the answer.

DISTRIBUTION OF DAYLIGHT in a room now can be estimated easily for almost any type of fenestration plan. The method presented here can be used for glass-block vision-strip exteriors, lighting with clerestories and various glass-block and sash combinations. Computations are simplified by the accompanying nomograph, which is based on numerous on-the-job performance studies.

The chart is applicable to all parts of the U. S. and Canada. It may be applied with reasonable accuracy to spaces of various sizes. However, reflectance values should conform to recommendations of the Illuminating Engineering Society and the dimensions of the room should be within the following limits: length not less than ⅓ the width; height not less than ¼ the width; and the fenestration area not less than 1/6 the floor area.

To use the nomograph, you should have or assume the following information: type of glass block, type of vision strip shading, orientation of fenestration, floor area, block-panel area, vision strip area, sill heights, ceiling height and surface reflectance values. The general approach is:

1. Establish, for a given time of day and year, the exterior illumination on each fenestration wall.

2. Determine, for each fenestration area, its component of the distribution pattern, corrected for sun azimuth and area effect.

3. Add the several components to determine the combined result.

• **Problem 1**—What brightness distribution will a vision-lighting plan provide in a classroom at 3 pm on May 15? Fenestration faces southwest at about 40 deg north latitude.

Estimating data:

Block used: Pittsburgh Corning Soft-Lite Prism B 55.

Vision strip: Clear-glazed sash plus roller shades.

Orientation: 45 deg west of true south.

Floor area: 30x30 ft, or 900 sq ft.

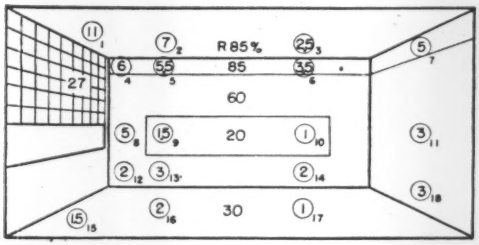
8-course block panel:
5⅓ × 30 ft = 160 sq ft

Vision strip area: 2½ × 30 ft = 75 sq ft

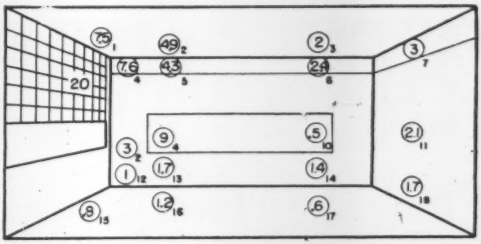
Total fenestration area = 235 sq ft

Reflectance: Acoustic tile ceiling—75%; chalkboard—20%; walls—50%; and floors—30%.

Procedure—From Chart 3A, for 3



SKETCH 1—Brightness in footlamberts produced by 100 ft-c of illumination is given by the circled numbers, for sky light only on Pittsburgh Corning Prism A 55 glass blocks and vision strip.



SKETCH 2—For sun and sky lighting, brightness in footlamberts produced by 100 ft-c of illumination is given by the circled numbers, for Soft-Lite Prism B 55 glass blocks and shaded vision strip.

pm on May 15, by locating the intersection of the horizontal May line with the diagonal 3 pm line and projecting down vertically to the curves below, you will find the exterior illumination to be 7,500 ft-c (for sun normal to fenestration).

From the table for approximate sun azimuth, you can interpolate to find the sun's angle. It will be 72 deg from true south at 3 pm on May 15; or 72 − 45 = 27 deg from the perpendicular to the fenestration. For this value, the table gives an azimuth correction of 4/5. Therefore, the effective exterior illumination will be 7,500 × 4/5 = 6,000 ft-c.

Next, estimate the brightness distribution using Sketch 2 values. The circled numbers in the sketch indicate the average brightness in footlamberts (ft-l) at the positions indicated for 100 ft-c of exterior illumination of fenestration. Surface reflectance is assumed to be 85%. Panel brightness is obtained by multiplying the circled numbers by the exterior illumination and dividing by 100. Surface brightness is computed by multiplying the circled numbers by the exterior illumination and dividing by 100, multiplying this product by the fenestration area and dividing by 35% of the floor area, and finally, multiplying the last product by the ratio of the actual reflectance of the surface to 85%.

Block panel: 20 × 6,000/100 = 1,200 ft-l.

Ceiling (position 1): 7.5 × 6,000/100 × 235/(0.35 × 900) × 75/85 = 296 ft-l.

Wall (position 4): 7.6 × 6,000/100 × 235/(0.35 × 900) × 50/85 = 300 ft-l.

The brightness at other parts of the room may be calculated in a similar way.

• **Problem 2**—What will the illumination distribution be in the same room?

Procedure—From Charts 3B and 3D, performance factors are obtained for use with the nomograph. Find

APPROXIMATE SUN AZIMUTHS—DEGREES — AZIMUTH CORRECTION

North Latitude	Sun Time	AM / PM	7 / 5	8 / 4	9 / 3	10 / 2	11 / 1	Noon / —
30 deg	March & Sept. 21		83	74	64	49	28	0
	June 21		104	99	92	84	67	0
	Dec. 21		60	54	44	32	17	0
40 deg	March & Sept. 21		80	70	57	42	23	0
	June 21		100	90	80	67	43	0
	Dec. 21		59	53	42	29	15	0
50 deg	March & Sept. 21		88	66	53	37	19	0
	June 21		95	83	70	53	29	0
	Dec. 21		—	52	41	28	14	0

Angle Between Sun's Azimuth And Perpendicular to Panel	Multiplying Factor
8	1
23	4/5
38	2/3
53	1/2
68	1/3
Over 75	Use Chart 1A

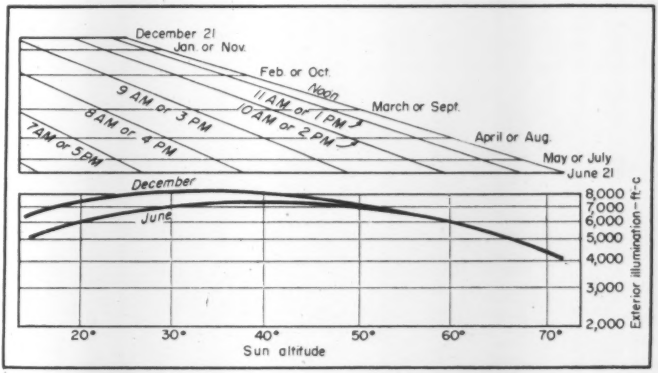
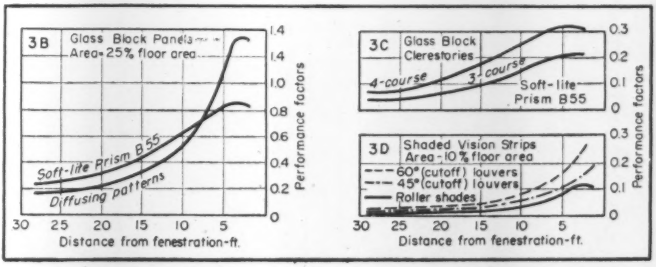
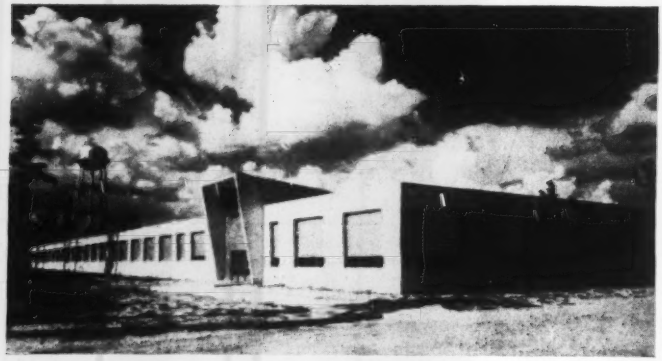


CHART 3A—Exterior illumination for both sun and sky light is given by the curves for different hours of the day throughout the year.



CHARTS 3B, 3C and 3D—Performance factors for sun and sky conditions. Plotted on Chart 2, these help determine illumination distribution.



GLASS BLOCK and glass-block-and-sash combinations enable the interior of Pinecrest Cotton Mill, Pine Bluff, Ark., to be daylighted.

the intersections of vertical lines at 5, 15 and 25 ft with the curves for Soft-Lite prism B 55 and shaded vision strip. These indicate the corresponding performance factors, which are to be plotted on Scale C in Chart 2. Draw straight lines between these values on Scale C and 7,500-ft-c exterior illumination on Scale A. The intersection of the lines with Scale B gives the foot-candles of illumination at each distance from the fenestration.

These values have to be corrected for azimuth and area, as was done in the brightness distribution calculations.

Illumination at desk level will be the sum of the foot-candles for the block and the vision strip. Values will be about 10% lower at points 5 ft from the end walls.

For problems in which light from the sky only (no sunlight) is involved Charts 1A, 1B, 1C and 1D should be used.

Charts and method of computation presented here were developed by Pittsburgh Corning Corp. and are based on research by Baker and Rapp (ILLUMINATING ENGINEERING, Dec., 1941) and data by H. H. Kimball (TRANSACTIONS, Illuminating Engineering Society, vol. 18, p. 457).

Salvaged steel saves Hawaii money

Steel, salvaged from an abandoned railway line, is helping to hold down the cost of a $14,000,000 highway construction project in Hawaii.

The project, which contains nearly as many bridges as there are miles of road, is a 40-mile artery that was born of disaster.

In April, 1946, a tidal wave thoroughly wrecked a struggling railway company that had helped to deliver sugar from the plantations of the Hamakua coast to the main island port in Hilo.

The wave knocked down several of the railroad's bridges, and the decision was made thereafter not to rebuild the line.

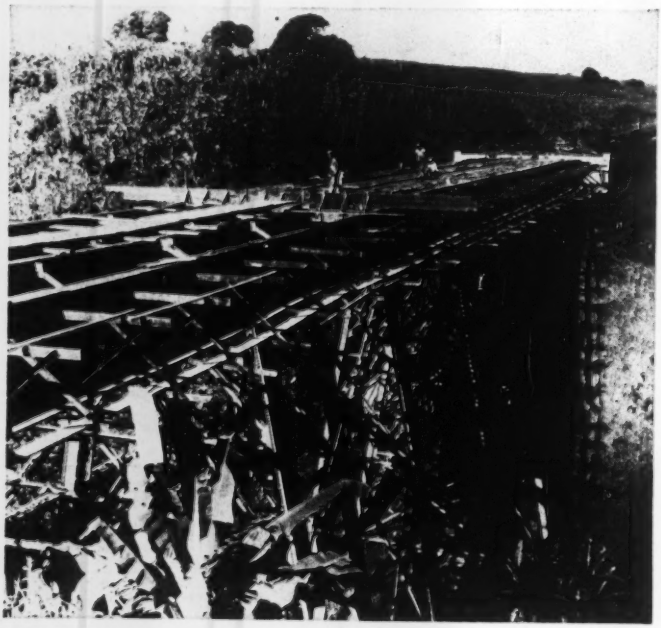
This lack of transport threw an extra, and nearly disastrous, load on the narrow coastal highway that zigzagged up and down the slopes of the many gulches that are beds of streams that cut back from the precipitous coast at the foot of dormant 13,825-ft Mt. Mauna Kea, a volcano.

In planning the new coastal highway, the territorial highway department bought a number of the railroad's bridges—five of them—to be used in their present locations, while others are being dismantled and their steel used to widen the five permanent structures.

The method used for rebuilding the bridges was worked out by Bridge Engineer William R. Bartels of the territorial highway department. It involves adding two lines of girders from the cannibalized bridges with the required supports.

Some of the girders taken from old bridges are being used in the construction of entirely new structures along the route. In addition, steel trusses from the toppled Wailuku River railway bridge form part of the new 115-ft high, 497-ft long Kolekole bridge. The first of the five former railway bridges converted to highway use is the two-lane Kapue bridge, five miles outside of Hilo.

The highway department said that its total savings through use of the salvaged steel would be $470,000.



BACK TO WORK—Steel, cannibalized from a railway bridge wrecked in a hurricane, is used as the core of a new highway bridge across Paheehee Gulch on Hawaii.

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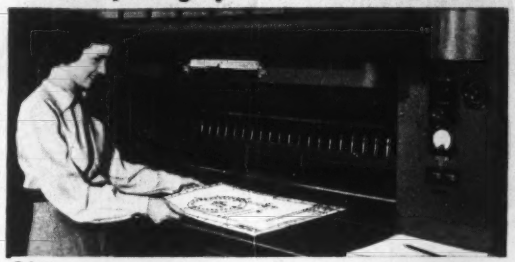
a new photographic intermediate material that speeds up print-making . . . drafting



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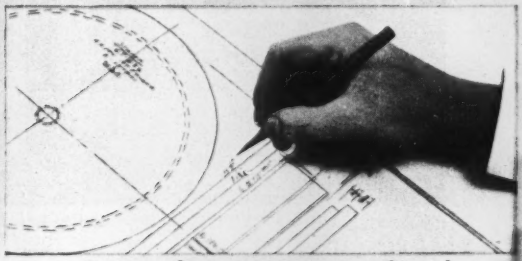
Its extra durability simplifies the handling of larger-size sheets . . . offers increased resistance to wear and tear in print-making and drafting.



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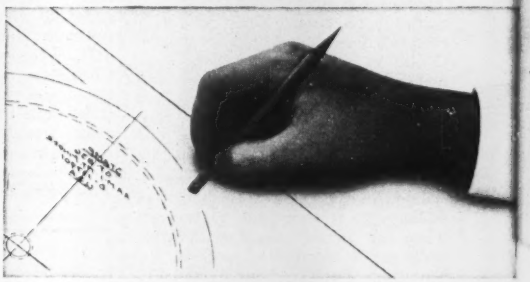

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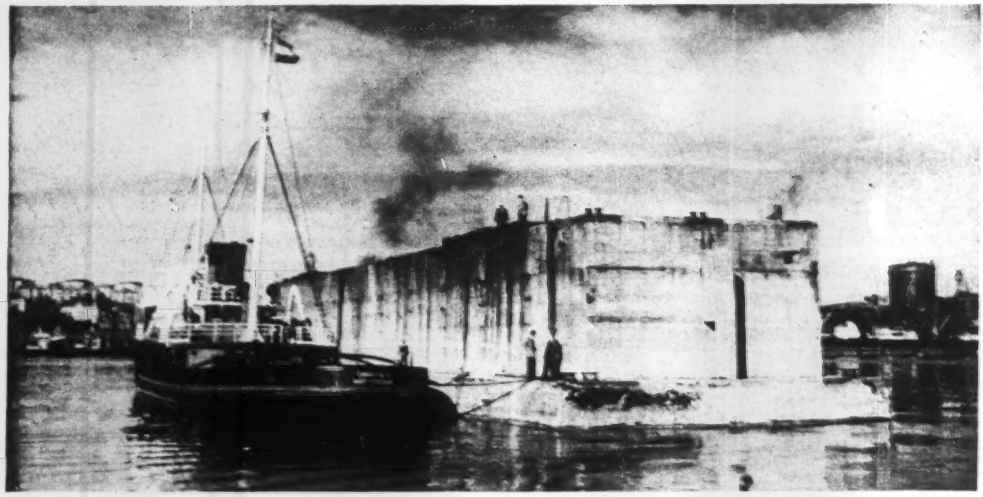


FROM FRANCE TO SWEDEN—Cassions used to form harbor for Normandy invasion now do service in Stockholm.

War-harbor caissons towed to Stockholm for a pier

P. Leimdorfer
Head, Department of Quays and Docks
The Stockholm Harbor Board
Stockholm, Sweden

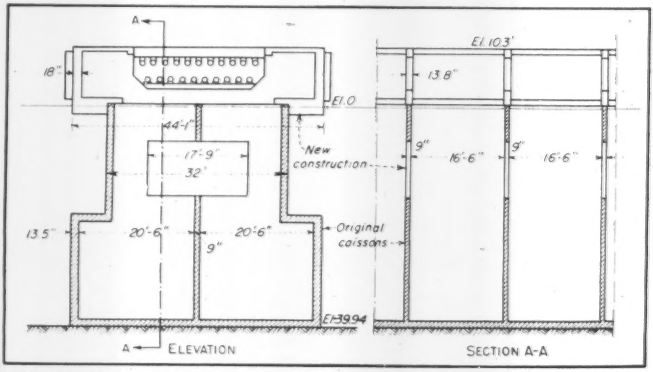
Two of the huge concrete caissons, known as Phoenixes, which were used to form the artificial harbors for the World War II landings on the Normandy coast of France have been purchased from Great Britain and towed to Stockholm, Sweden. Here they will be placed end to end, repaired in certain particulars and constitute a pier in the oil harbor of the port.

Each of the caissons is about 204 ft long, 44 ft wide and 40 ft high. They are hollow boxes with cross walls and a longitudinal wall on the centerline. Each contains about 1,712 cu yd of concrete and 178 tons of reinforcing steel.

• **Condition**—Some damage had occurred to the caissons during their 6 years of exposure off the Normandy beach, as might be expected of structures planned for about a 3 months' life. There were some shrinkage cracks on the outside of the walls caused by the lack of surface reinforcement; the main bars were embedded about 2 in., and up to 2.5 ft apart c to c. There developed some cracks on the inner wall surfaces (principally in the vicinity of the cross walls) caused by temperature strains; the caissons were decked over, and the resulting temperature differences between inside and outside wall surface sometimes reached 65 deg F. And there was corrosion of some structural steel details, which had been added to increase the anchorage between the longitudinal- and the cross-walls. These details had been installed when tests of the first caisson showed an unexpected internal head of 6 or 7 ft between the water inside and the wave troughs outside. This head caused considerable tension in the cross walls—tension that had not been anticipated in the original design.

• **Reconstruction**—Originally the longitudinal walls (sides and center) had been considered the main structural unit. To repair the cracks in these walls would, however, be too expensive so it has been decided to transfer the principal resistance to the cross walls. This will be done by casting a concrete layer around the rusty steel anchorages at the junctions of the cross walls with the longitudinal walls. Large openings in the cross walls will also be concreted shut to enable these walls to take horizontal shear stresses.

Upon the existing caissons a 10-ft-high superstructure will be constructed on which the oil pipelines can be installed. In the bottom of the caissons, which will be sunk to a gravel bed, a 6-ft rock or sand filling will be placed to insure stability against horizontal impact from boats.



HOW CAISSONS WERE ALTERED to form the oil pier in Stockholm harbor.

BOOK REVIEWS

The place of highways

HIGHWAYS IN OUR NATIONAL LIFE—A Symposium edited by Jean Labatut and Wheaton J. Lane under the sponsorship of the Bureau of Urban Research, Princeton University. 506 pp. Princeton University Press, Princeton, N. J. $7.50.

An imposing array of authors contributed to this unusual and ambitious attempt to set forth the variety of ways in which highways impinge on the life of this nation. Forty five in all, the contributors range from historians, economists and sociologists to practical highway engineers. And as might be expected, the views expressed range from some that appear to be visionary and unrealistic to sound conclusions based on hard facts.

The historical material, which goes back to the trade routes of ancient times, is very good except for the maps, which were not drawn or lettered for reduction to book size. Highway developments in this country are covered concisely but adequately for the purposes of such a book.

More than half the book is given over to discussion of modern highways including such subjects as the general principles involved in financing, planning, design of express ways and intersections, construction and maintenance of highways, safety and traffic regulation, and the relation of highway traffic to other forms of transportation.

Know your materials

MATERIALS OF CONSTRUCTION—By John H. Bateman. 568 pp. Pitman Publishing Corp., New York, Toronto and London. $6.50.

As the author points out in the preface of this textbook, it is essential that engineers have a knowledge of the raw materials, production and properties of the principal materials of construction. Intended for the use of undergraduate students of civil and architectural engineering, the book was written to supply the needed information. It explains the significance of the mechanical properties of materials and then goes on to indicate how the various raw materials are obtained, how they are processed to yield the materials of construction, how the finished materials are shipped, handled and stored, and what the properties of these materials are. This treatment is accorded cementing materials, such as quicklime, plasters and portland cement; concrete; mineral aggregates; structural clay products; building stone; wood; steel and iron; aluminum; and magnesium.

Miscellaneous Notes on Booklets and Reprints

A NEW EDITION OF THE GUIDANCE MANUAL for engineers aiding young men interested in the engineering profession has been issued by the Engineer's Council for Professional Development, 33 West 39th St., New York 18. Accompanying it is a questionnaire to be filled out by students, which is entitled "Shall I Study Engineering." The manual and questionnaire sell for 20 cents, with a discount of 25% on more than 25 copies. Both are sold separately also for 15c and 10c.

PREVENTING STEAM POLLUTION From Oil Pipeline Breaks is the title of a guidebook of recommended practice published by the Ohio River Valley Water Sanitation Commission. Probably the first booklet dealing with this subject, it points out the need for break prevention, briefs out the necessity for emergency organization and tells what to do when a break occurs. Copies may be obtained without charge by writing to the commission, 414 Walnut St., Cincinnati 2, Ohio.

Reports and Pamphlets

WASHINGTON PRESENT AND FUTURE—Monograph No. 1, A General Summary of the Comprehensive Plan for the National Capital and Its Environs—Prepared by Harland Bartholomew & Association, St. Louis, for the National Capital Park And Planning Commission, Washington, D. C.

PENNSYLVANIA HIGHWAYS TODAY & TOMORROW—Report of the Highway Planning Commission to the governor and General Assembly of the Commonwealth of Pennsylvania, Harrisburg, Pa.

AN ENGINEERING STUDY OF OHIO'S HIGHWAYS, ROADS AND STREETS—A report to the Ohio Program Commission and the Highway Study Committee by the Automotive Safety Foundation, 700 Hill Bldg., Washington 6, D. C.

(*Continued on page 48*)

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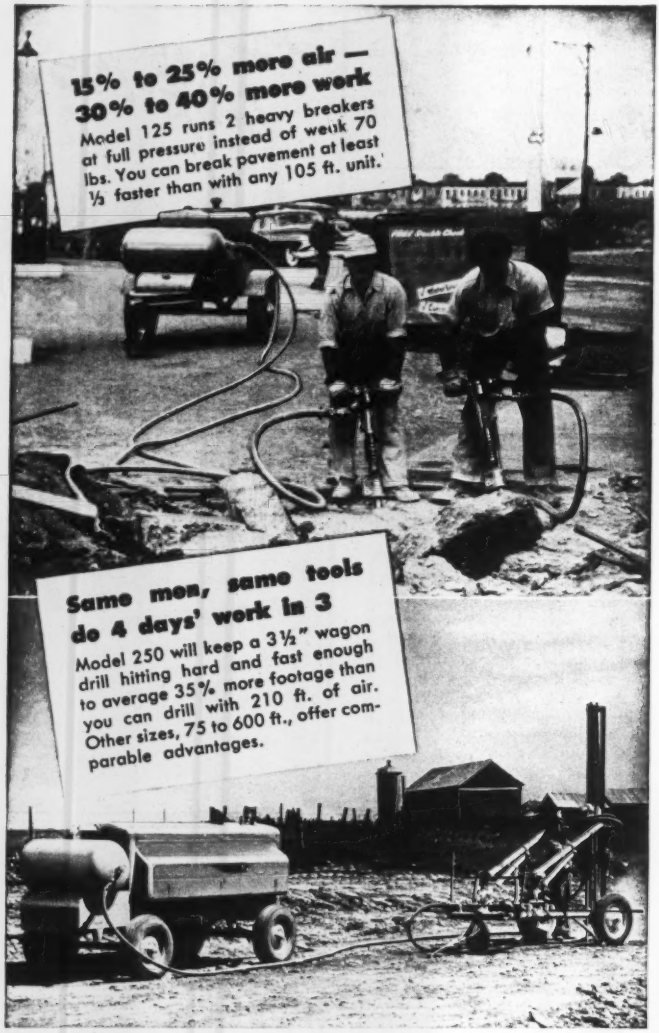
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Reports and Pamphlets

(*Continued from page 47*)

A Quantitative Method for Determining Groundwater Characteristics for Drainage Design—By John G. Ferris. Michigan Geological Survey Division, 205 Capital Savings and Loan Building, Lansing 68, Michigan.

Septic Tank Studies (Individual Sewage Disposal Systems)—Technical Paper No. 15, May 1950. Obtainable from the Housing and Home Finance Agency, Washington 25, D. C. No charge.

Tentative Standard Specifications for Ferrous Sulfate—American Water Works Assoc., 500 Fifth Ave., New York 18. 15c.

Tentative Standard Specifications for Sodium Fluoride—American Water Works Assoc., 500 Fifth Ave., New York 18. 15c.

Descriptive Color Names Dictionary—A Supplement to the third edition of the Color Harmony Manual. Container Corporation of America, Chicago 3, Ill.

The Measurement of the Wind Load on a Spirally Guided Gasholder—The Gas Research Board, The Abbey, Southend Road, Beckenham, Kent, Eng.

Improved Nails for Building Construction—Bulletin of the Virginia Polytechnic Institute, Blacksburg, Va.

Proceedings of the Second California Institute on Street and Highway Problems—1950—The Institute of Transportation and Traffic Engineering, University of California, Berkeley, Calif.

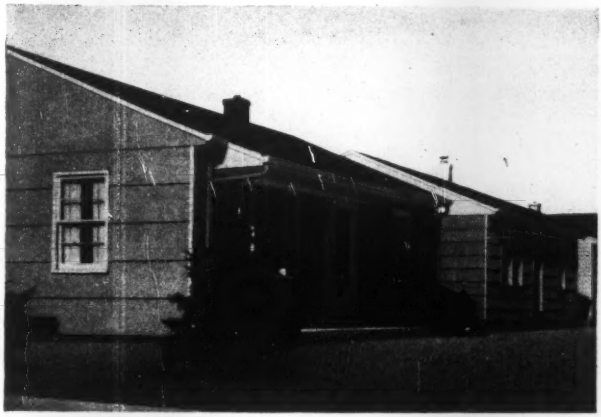
Safety in Electric and Gas Welding and Cutting Operations—American Standard—American Welding Society, 33 W. 39th St., New York 18. $0.50.

Proceedings of the Thirty-Fifth Annual Highway Conference (1950)—University of Michigan, Ann Arbor, Mich.

Concrete Beams With Compression Reinforcement—Bulletin No. 4. Division of Building Statics and Structural Engineering, Royal Institute of Technology, Stockholm, Sweden.

Concrete Slabs Reinforced in Two Directions—Bulletin No. 5. Division of Building Statics and Structural Engineering, Royal Institute of Technology, Stockholm, Sweden.

Calculation of Deformations in Reinforced Concrete Structures After Formation of Cracks—Bulletin No. 6. Division of Building Statics and Structural Engineering, Royal Institute of Technology, Stockholm, Sweden.

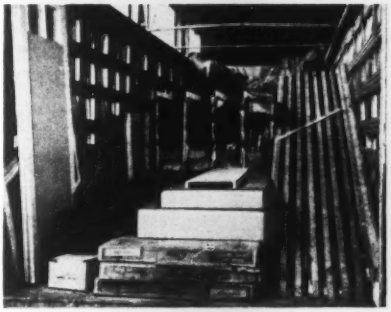


"P & H HOMES," prefabricated by the Harnischfeger Corporation, Houses Division, Port Washington, Wisconsin, are built for permanence. Important structural members are preserved with Monsanto Penta.

BUILT ON ASSEMBLY LINES, "P & H Homes" are 83% completed when shipped. They can be erected with only 155 hours of on-the-site labor. Harnischfeger production is geared for developing communities.

Idea for defense building

DIMENSIONAL STABILITY, important in prefabrication, is assured by water-repellent formulations of Monsanto Penta. Photo shows workmen assembling trusses and gables.



SEMITRAILERS carry "P & H Homes" to the spot where they are erected. These homes mean housing in a hurry, plus economy and long life with penta-treated wood.

Build with speed, but build for permanence. That's the idea behind "P & H Homes," which have important structural members, gables, siding and trim treated with Monsanto Penta, the *permanent* wood preservative. It's a basic idea, because defense housing is needed immediately and experience has shown that most such projects become permanent communities.

Water-repellent formulations containing Monsanto Penta (pentachlorophenol) provide dimensional stability so important in prefabricated structures. In addition, penta protects against termites and other insects that attack wood and prevents decay due to fungi. Monsanto Penta can be formulated in *clean* treatments so that the wood can be painted or varnished. Years of service prove that penta gives enduring protection because it is a stable chemical and does not leach nor dissolve in rain or ground water.

Whether you're building a home or a hangar . . . a platform or a pavilion . . . you can put longer life into the structure with Monsanto Penta. For information on Monsanto Penta and for sources of supply of penta formulations or penta-treated lumber, contact the nearest Monsanto Sales Office or write MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1759-E S. Second St., St. Louis 4, Mo.

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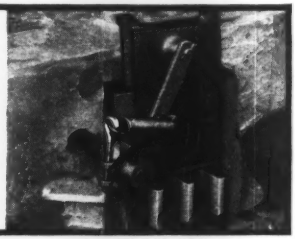

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READER COMMENT

Prestressing with glass

Sir: I read with great interest Professor I. A. Rubinsky's suggestion for the use of glass fibers instead of steel wires for prestressed concrete (ENR March 1 p 45).

May I call to your attention that this problem was presented in 1942 by Eugene Freyssinet who is best known for his outstanding work in the field of prestressed concrete. In his excellent study. "L'exposé ensemble de l'idée de la précontrainte" (Annales de l'Institut Technique du Bâtiment et des Travaux Publics, June, 1949, Béton Precontraint No. 13), he presents the actual problems and future possibilities of prestressing. Therein he mentions the possible replacement of steel wires by glass fibers. Characteristics given there are similar to those mentioned in your article. However, the ultimate strength values are somewhat lower.

Freyssinet declares that the main problems involved and which must be cleared by further research work are: Creep of glass fibers, effect of temperature, effect of cements, and uniform distribution of stresses. The present high cost of glass fibers must be lowered to obtain an economical solution.

THOMAS CHOLNOKY
Frederic R. Harris, Inc.
27 William St.
New York 5, N. Y.

Bouquets

Sir: I have just seen a copy of the March 22nd issue of ENGINEERING NEWS-RECORD and I want to compliment you on the fine article on the perlite curtain wall which appears on page 23.

As with all your editorial copy, it is concise and to the point. I am very sure the readers of your magazine will be interested in this new development.

R. L. CORNISH
Great Lakes Carbon Corp.
New York, N. Y.

Correction

Sir: In your issue of the 1st of March, you publish a photo of the Zêzere River Dam, constructed at Castelo do Bode, Portugal.

In the note under the photo you state that construction was done by a British firm, which is not exact.

The contractors were the associated firms of Moniz da Maia, Duarte & Vaz Guedes, Lda., of Lisbon and S. A. Conrad Zschokke, of Genève.

The big construction equipment was bought from a group of British Firms by the owner and placed at the disposition of the successful bidders.

The diversion works were carried out by the Portuguese firms above.

All work was completed in four and a half years including diversion works, dam and powerhouse.

JOSE DE QUEIROZ VAZ GUEDES
Civil Engineer
Lisboa

Who's who on Portugal dam

Sir: I was very pleased to see the picture showing Portugal's new Castelo do Bode Dam (ENR Mar. 1, 1951, p. 49) but it is not completely correct to say that a British firm built it.

Construction was done by a joint venture of Portuguese (Moniz da Maia, Duarte & Vas Guedes, Lda.) and Swiss (Zschokke) contractors. Mechanical engineering in the power plant and outlet house alone was done by a British firm. The civil engineering in the power house was designed by the owner, Hidro Electrica do Zezere Society, under the supervision of A. C. Xerez, its chief engineer. The spillway gates and penstocks were specially designed and built by Neyrpic-Soreframe Co., the Portuguese branch of Neyrpic, a French firm. This company also performed the difficult hydraulic testing of the spillway scale models.

The dam itself was designed by Andre Coyne, French consulting engineer.

PIERRE LONDE
A. Coyne and Bellier
Consulting Engineers, Paris

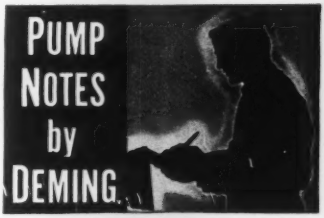
One more

Sir: In your March issue, p 49, in connection with completion of the Zezere dam at Castelo de Bode, you state: "Construction was done by a British firm."

The statement is absolutely incorrect. Construction was done by Moniz da Maia, Duarte e Vaz Guedes, Lda., a firm of Portuguese Engineers both consulting and constructors.

The driving turbines and electrical equipment were supplied by British firms, but only those. All the rest was designed and built in Portugal.

A. GOMEZ
Chief, Bitumen Dept.
Shell Co. of Portugal, Ltd.



INDUSTRIAL SOLVENT PUMPS

Deming Fig. 4703 (illustrated) is a vertical turbine type pump designed for pumping gasoline, oil and industrial solvents from underground tanks or from tanks located above ground where it is desirable to have pump located at top of tank.

Capacities range from 15 to 75 G.P.M. for pressures up to 100 lbs., depending upon capacity.

Single or three phase motors with ratings from ½ to 2 H.P. are optional in vertical solid shaft explosion proof type (for hazardous conditions), or standard open type motor (for non-hazardous conditions).

Motor adapter of cast iron has built-in flexible drive coupling with heavy ball thrust bearing.

Discharge head of heavy cast iron construction has 9" diameter base for mounting on standard 4" companion flange. Discharge is threaded for 2" standard pipe.

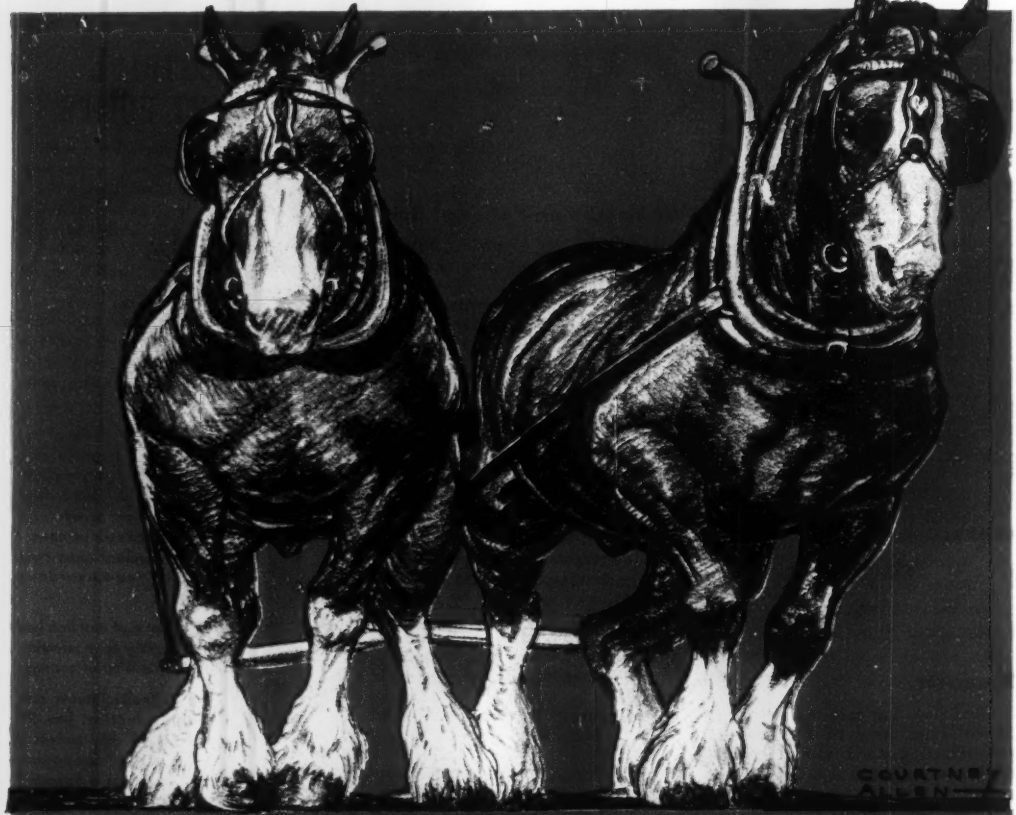
Bronze semi-enclosed adjustable, impellers in bowl assembly are mounted on stainless steel impeller shaft with split, tapered steel sleeves and bronze locking nuts.

For more details on this and other Deming Turbine-Type Pumps, write for BULLETIN No. 4700.

THE DEMING COMPANY
536 Broadway, Salem, Ohio

SPECIFY DEMING PUMPS

in city streets lay pipe



Like a Clydesdale horse cast iron pipe is known for strength

Known strength factors! Proved resistance to corrosion! These are your only safe and sure guides to long life and low maintenance expense of water, gas and sewer mains laid under costly modern pavements. The four strength factors that pipe must have to survive traffic shocks, heavy external loads, beam stresses and severe working pressures are listed on the page opposite. *No pipe that is deficient in any of these strength factors should ever be laid in paved streets of cities, towns and villages.* Cast iron water and gas mains, laid over a century ago, are serving in the streets of 30 or more cities in North America. These attested service records prove that cast iron pipe not only assures you of effective resistance to corrosion but all the strength factors of long life and economy, as well.

known for STRENGTH

No pipe that is deficient in any of the following strength factors should ever be laid under paved streets.

CRUSHING STRENGTH

The ability of cast iron pipe to withstand external loads imposed by heavy fill and unusual traffic loads is proved by the Ring Compression Test. Standard 6-inch cast iron pipe withstands a crushing weight of more than 14,000 lbs. per foot.

BEAM STRENGTH

When cast iron pipe is subjected to beam stress caused by soil settlement, or disturbance of soil by other utilities, or resting on an obstruction, tests prove that standard 6-inch cast iron pipe in 10-foot span sustains a load of 15,000 lbs.

SHOCK STRENGTH

The toughness of cast iron pipe which enables it to withstand impact and traffic shocks, as well as the hazards in handling, is demonstrated by the Impact Test. While under hydrostatic pressure and the heavy blows from a 50 pound hammer, standard 6-inch cast iron pipe does not crack until the hammer is dropped 6 times *on the same spot* from progressively increased heights of 6 inches.

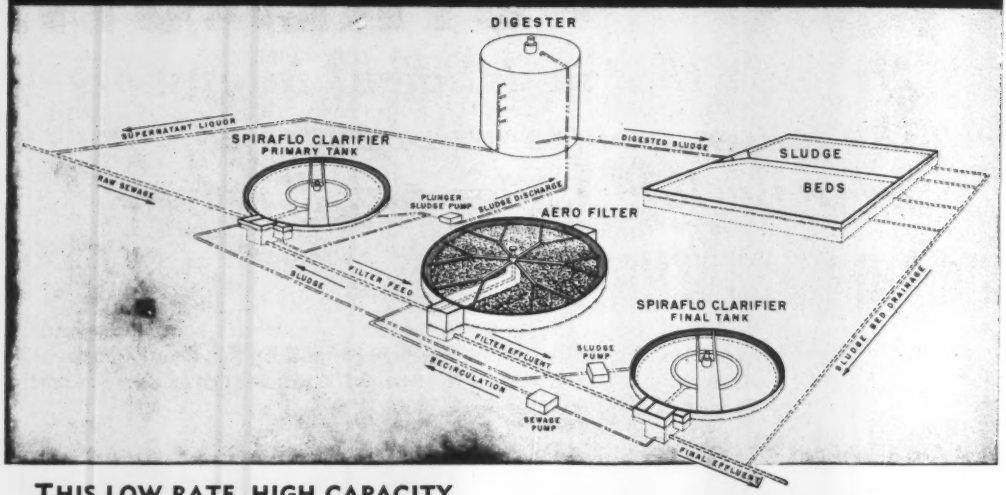
BURSTING STRENGTH

In full length bursting tests standard 6-inch cast iron pipe withstands more than 2500 lbs. per square inch internal hydrostatic pressure, which proves ample ability to resist water-hammer or unusual working pressures.

CAST IRON PIPE RESEARCH ASSOCIATION, THOS. F. WOLFE, MANAGING DIRECTOR, 122 SO. MICHIGAN AVE., CHICAGO 3.

CAST IRON PIPE SERVES FOR CENTURIES

There's a YEOMANS Plant FOR EVERY WASTE TREATMENT NEED!



THIS LOW RATE, HIGH CAPACITY TRICKLING FILTER PLANT IS ESTABLISHING AMAZING RECORDS FOR HIGH PURIFICATION AT EXCEPTIONALLY LOW COST

These figures show a typical result produced by a Yeomans installation of the "Aero-Filter" and "Spiraflo" Clarifier in combination.

Overall plant efficiency is always higher when these units are used together. The method is especially effective for treating strong industrial wastes.

OPERATIONAL DATA . . . . SPIRAFLO—AERO-FILTER PLANT*

		Raw Sewage		Primary Effluent				Final Effluent				Overall Plant Reduction	
1949 Date	Sewage Flow M.G.D.	Sus. SOLIDS PPM	B.O.D. PPM	Sus. SOLIDS PPM	Per Cent Reduction	B.O.D. PPM	Per Cent Reduction	Sus. SOLIDS PPM	% Reduction	% PPM	% Reduction	Sus. Solids %	B.O.D %
6-15	0.2996	210	255	79	62.4	136	46.6	28	64.6	18	86.8	86.6	93.0
6-16	0.2467	425	260	85	80.0	127	51.2	23	73.0	19	85.1	94.6	92.6
6-17	0.2554	410	235	124	69.7	141	40.0	28	77.4	18	87.3	93.3	92.4
6-18	0.2487	308	222	76	75.4	108	51.4	34	55.3	16	85.2	89.0	92.8
6-19	0.1753	222	218	64	71.2	132	39.5	17	73.5	—	—	92.4	—
6-20	0.2666	262	320	88	66.4	147	54.1	20	77.3	30	79.6	92.4	90.6
6-21	0.2279	240	215	78	67.5	138	35.8	19	75.7	20	85.7	92.0	90.7
Average	0.2456	297	247	85	70.5	132	45.5	24	71.0	20	85.0	91.5	92.0

* Name of plant furnished on request, as well as operating data from other installations.

"SPIRAFLO" ADVANTAGES

- Increased B.O.D. and settleable solids removal—influent is introduced tangentially into annular race around the periphery. Sewage spirals downward slowly and enters main clarification compartment at the bottom of the tank. Uniform, slow diffusion of waste under the skirt results in greatly reduced velocities and provides maximum removal of settleable solids.
- Greater removal of finely divided particles—due to upward flow through sludge blanket. This increases flocculation and results in more effective removal of finely divided particles before waste enters the effluent weirs.
- Straight-wall design minimizes construction costs.

"AERO-FILTER" ADVANTAGES

- Thorough uniform distribution—therefore costly recirculation for dilution is unnecessary
- Operating cost is lowest of any type of complete sewage treatment
- Uninterrupted and almost complete momentary bed coverage minimizes troubles from odors, freezing, ponding, filter flies
- All returns made direct to the filter—no oversize primary tank required.

FOR INDUSTRIAL WASTES, TOO . . . Many types of industrial wastes can be successfully treated by direct application to the Aero-Filter without preliminary sedimentation.

Bulletins containing full details and helpful engineering data will be sent promptly upon request.

YEOMANS BROTHERS COMPANY
1445 North Dayton Street, Chicago 22, Illinois

☐ "Aero-Filter"— No. 6570
☐ "Spiraflo" Clarifier—No. 6790

Please send these bulletins.

Name .....
Business .....
Address .....
City ..... State .....

YEOMANS

A COMPLETE LINE OF SEWAGE AND WASTE TREATMENT EQUIPMENT AND PUMPS FOR BUILDINGS, MUNICIPALITIES, INDUSTRIAL APPLICATIONS

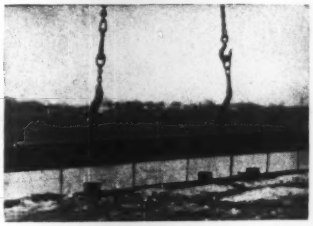
FIELD AND OFFICE

Flame-cut slotted pipe

Production time was cut approximately 80% when flame-cutting was substituted for milling on a pipe-slotting contract, according to the Alamo Iron Works of San Antonio, Tex.

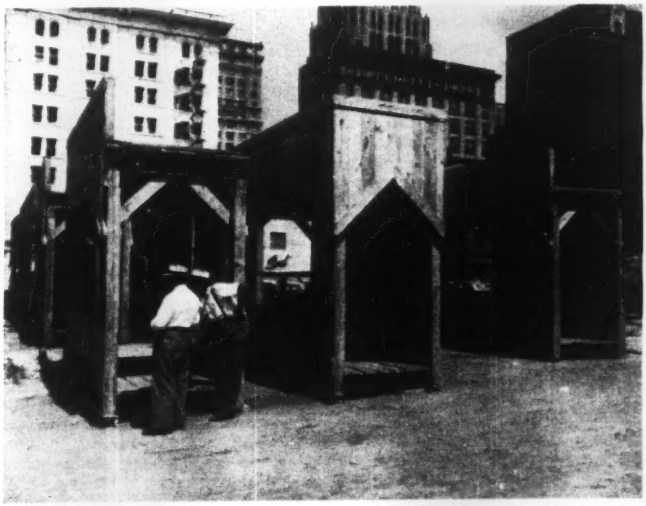
The job consisted of cutting 3,000 slots (8x⅝ in.) in 40 sections of pipe to be used as well screens in an irrigation well for the City Water Works of Eagle Pass, Tex.

A blowpipe with a special 2-nozzle coupon adaptor was mounted on an Oxweld portable cutting machine to cut both sides of each slot in one pass. Drilled holes started the cuts. No finishing operation was required. Oxygen consumption for the job was 1,380 cu ft; acetylene consumption was 200 cu ft. In all, 2,700 linear feet was completed in 10⅓ operator hours.

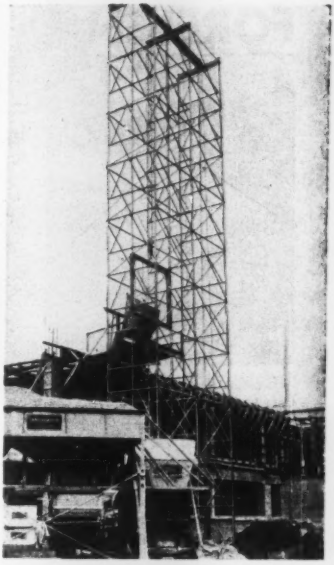


Miter post hooks

Handling of heavy 12x12 timbers used as quoin and miter seals on lock gates is simplified by a special-type miter post hook designed by Cosme R. Escribano, crane operator at the Neville Island repair station of the Corps of Engineers, Pittsburgh District. Inserted in the bolt holes, the hooks permit swinging the timbers in a horizontal position while they are placed. Hook ends extend beyond the pins and are guided into bolt holes in the gate. Then the pins are pulled and the now-positioned seal is moved to the gate. After sufficient bolts are placed, the hooks are removed.



PREBUILT STREET WALKWAYS—In Houston, Tellepsen Construction Co. builds walkways in advance, allowing streets to be opened early. Also, it's simpler for the carpenters to build them away from street traffic. Each section is 12 ft long, 6 ft wide, and has a 5-ft walkway. Roofs are braced with 2x10 planks. After sections are placed, the roof of two or more provide space for the job office. Sections are easily moved with a minimum waste of lumber and labor.—Harry A. Hess, Houston, Tex.



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★ PROVIDE GREATER JOB SAFETY

Save up to 50% in erection and dismantling time . . . gain in convenience and safety . . . with the all-steel Safway "Intermediate" Material Tower.

4,000 lbs. capacity—200 ft. maximum height. Double and single well types. Available with 3-wheelbarrow cage platforms, concrete bucket and hopper, and 1,000 lbs. capacity, 15 ft. boom (full 180° swing).

Construction jobs are completed faster, better, safer and more profitably with Safway Material Towers and this other equipment:

Other Safway Products
- Tubular steel shoring.
- Tubular steel scaffolding.
- Mason scaffolds.
- Swing scaffolds.
- Sidewalk canopies.

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FOREIGN

MEXICAN EXPRESSWAY—Here is a general view of the start of the new Mexico City to Cuernavaca expressway which will enable motorists to cover the 50 miles in 40 minutes instead of the 1½ hours required on the existing highway. The new road, to be completed this year, will be the first toll superhighway in Mexico. It is expected to handle a big part of the 2400 vehicles a day which travel between the capital and the popular resort center of Cuernavaca. The expressway, privately financed and costing $5,000,000 is a 4-lane, divided highway, each section of which is 22 ft wide. The shoulders are 10 ft wide. At Cuernavaca the new road will connect with the highway to the well-known Pacific part of Acapulco.

Foreign briefs

Worldwide heavy construction—The Morrison Knudsen Co. and the Societe des Batignelles of Paris have pooled resources to create a new affiliate in Paris called the Societe Anonyme Batignelles-Morrison Knudsen. It will take on heavy public works construction projects all over the world. First targets will be underdeveloped areas in India, the Near East and Africa. Negotiations are already under way for irrigation and power jobs in Asia, Africa and Latin America.

Egyptian dams—Osman Moharran Pasha, Egyptian minister of public works, says that with the completion of the Wadi-Rayan (Egypt), Merowe (Sudan) and Tsano Lake (Ethiopia) dams, now being planned, the volume of stored water to be obtained by Egypt from the Aswan and Gebeal Awlia dams would be doubled. To complete control of the flow of water in the Nile tributaries in the Delta, a dam would be built across the Damietta branch of the Nile at Faraskur. The financing of all these projects is still under discussion.

Ethiopian communications—The International Bank for Reconstruction and Development has made a loan of $1,500,000 to the empire of Ethiopia for the rehabilitation and extension of that country's telephone and telegraph systems. At present there are less than 2,000 telephones for a population of more than 12,000,000.

Engineering building—Many delegates to the ASCE convention at Houston, Tex., went to Mexico City on the invitation of the Mexican government to attend groundbreaking on Feb. 26 for a new engineering building at the University of Mexico, which was designed by Francisco Serrano, Mexican civil engineer and architect.

Bolivian airports—The Knappen Tippetts Abbett Engineering Co. has been retained by the government of Boliva to prepare a survey for airports located at LaPaz, Sucre, Cochabamba and Santa Cruz. The first stage of the survey will include an analysis of the construction costs, existing use charges, anticipated revenues and proposed methods of financing. The work will be closely coordinated with the Civil Aeronautics Administration Airport Mission at La Paz.

Peruvian section P. A. highway—The Peruvian section of the Pan American Highway has been opened for all-weather traffic from Ecuador to Bolivia and Chile. The main route in Peru from La Tina to Concordia has a length of 1632 miles, the alternate routes in the north (to Aguas Verdes) and in the south (to Desaguardero) add 489 miles to make a total of 2121 miles for the system. Of the total, approximately 1062 miles are asphalt-paved. Further paving and other improvements are now in progress. Where the road is being rebuilt (Lima-Ica), the asphalt pavement is to be extended to a width of almost 20 ft.

International mission to study Iraq resources

The International Bank for Reconstruction and Development is sending a mission to Iraq to undertake a general review of that country's economic possibilities and to make recommendations for further development.

Nationals of seven different countries—France, India, the Netherlands, the Philippine Republic, Sweden, the United Kingdom, and the United States—are included in the 14-man team of experts composing the mission.

Included in the fields to be covered are flood control and drainage, transportation, industry and power, public health, education, public administration, community planning and housing.

The mission will be headed by Ivar Rooth, Swedish financier. The United States members are: John C. deWilde, chief economist; M. A. Kriz, public finance; Luther G. Jones, agronomist; and Carl Flesher, industry and power. Dr. A. E. Lorenzen, England, is the public health expert.

Orly Airfield enlarged

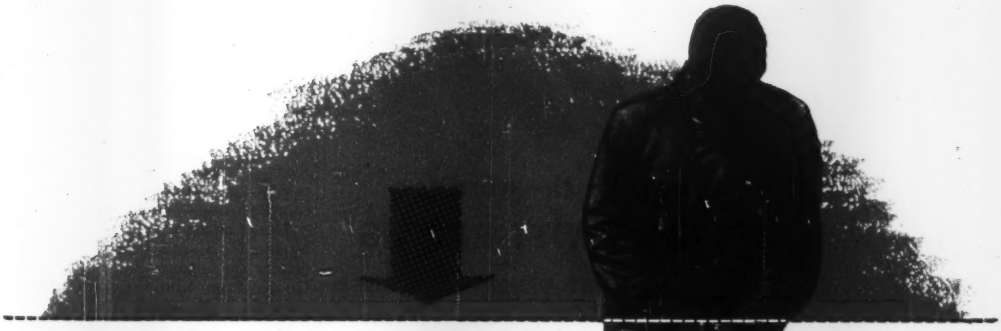
Orly Airfield near Paris is being greatly enlarged. When a construction program now under way is completed the field will cover more than twice its present area and its technical facilities will be largely augmented. The total area will be increased from 1,976 to 4,446 acres.

The work began last year with a government grant of $2,850,000, half of which came from Marshall Plan counterpart funds.

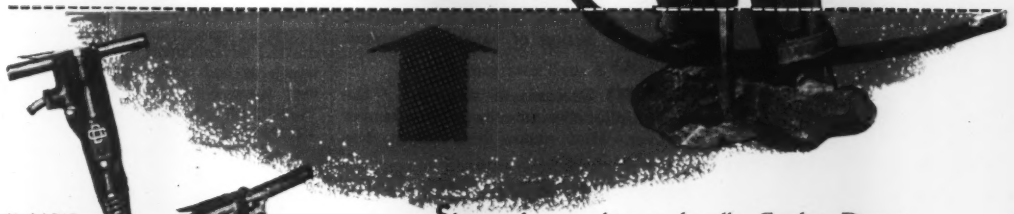
The illustration shows a new parking apron being made at Orly.

New Zealand pier—Merritt-Chapman and Scott Corp. and Raymond Concrete Pile Co. of New York will participate in a joint venture with the Fletcher Construction Co. Ltd., of Auckland, New Zealand, for the construction of a 4-berth ocean freight terminal at Auckland at a cost of about $5,137,409. The pier, to be known as Import Wharf, will be built on the last available water front site in the main section of the city. It will be of earthquake-proof design, on reinforced concrete piling.

(*Continued on page 58*)

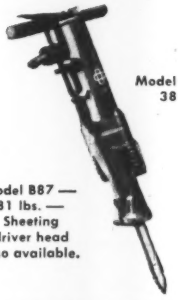


SHORT
WHERE IT COUNTS
...LONG
ON QUALITY



Model B67 — 63 lbs.

Model B37 — 38 lbs.



Model B87 — 81 lbs. — Sheeting driver head also available.

New Sump Pump Dependability

The VP4 Sump Pump is designed on a new principle of *Top-Suction* — won't bury itself in a muddy sump. Top-Suction also pulls gritty water away from the shaft seal — protects the seal, shaft and motor from wear — sharply reduces maintenance. "One-shot" lubrication oils entire pump for 24 hours of service.

Shorter from tool-top to handle, Gardner-Denver Paving Breakers are easier to hold! Your men move about the job faster and safer, too — thanks to the exclusive Gardner-Denver safety latch that works like the safety on a gun.

And here are some of the quality *extras* that make these breakers powerful "busters" on your demolition jobs:

Automatic short throw valve — virtually unaffected by wear.

Non-freezing exhaust — maintains top efficiency on cold, damp days.

Renewable chuck liner — protects both tool and breaker against loose-fitting shank.

Integral oil reservoir — insures proper lubrication to all working parts.

SINCE 1859

GARDNER-DENVER

Gardner-Denver Company, Quincy, Illinois
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THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS

TOUGH

is the word for

HEWITT-ROBINS

cement placement hose

If you're looking for a cement placement hose with the *right* combination of strength, light weight, and flexibility —try Hewitt-Robins!

TOUGH! Carcass wall is extra-strong, reinforced with multiple plies of high tensile duck bonded with pure gum rubber. That means stretch-resistance that keeps the hose from expanding under pressure. Inner tube is compounded of gum rubber—*a full ¼ inch thick*—especially treated to withstand abrasive action of sand and cement mixtures.

LIGHT! Exceptional strength of the duck plies eliminates need for a rubber cover. That means less weight, less worker fatigue.

FLEXIBLE! High quality materials and built-in toughness give this hose less bulk, more flexibility. That means real handling ease.

YES, HEWITT-ROBINS gives you the *right* combination in cement placement hose to meet even the heaviest service requirements in mines, tunnels, viaducts, bridges, wherever cement reinforcements are used.

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BELT CONVEYORS *(belting and machinery)* • BELT AND BUCKET ELEVATORS
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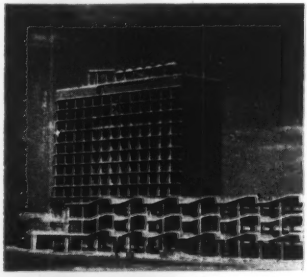
U. S. experts to make Litani River survey

A 10-man Bureau of Reclamation mission has left for Beirut to give requested cooperative aid to the Republic of Lebanon. It will make a 3-months study of the feasibility of basin-wide development of the Litani River. Irrigation and hydroelectric power are basic necessities for the country's economic development.

Under an agreement signed recently by the U. S. and Lebanon, the specialists are financed by the Technical Cooperation Administration, Department of State, which administers the Point 4 program under the International Development Act.

Headed by Robert F. Herdman, the mission will include Arthur F. Johnson, M. R. Lewis, R. E. Winchell, H. M. Fresen, S. B. Foster, R. M. Ancell, W. W. Gorton and F. C. Roberts, Jr.

In 1949, a United Nations economic survey mission, headed by Gordon Clapp, chairman of the T. V. A. Board, visited Lebanon and recommended development of the Litani River as one of the major means of increasing agricultural output and industrial advancement in this country which as had undeveloped resources ever since King Solomon used the "Cedars of Lebanon" in building the Temple at Jerusalem.



MEXICAN SCHOOLHOUSE—First of a score of new structures now under construction for a brand-new campus for the University of Mexico is the science building. The 15-story, reinforced concrete, central tower is flanked by low wings which will contain classrooms. Classroom floors, cast as integral parts of the wing structures, have built-in slopes to provide clear views of the rostrums. The university—now housed in buildings scattered all over Mexico City, is being built on a huge lava bed (known as the Pedregal) which will be landscaped when buildings are completed. Campus will cover 21 million sq ft, contain football fields, swimming pools, a 140,000-capacity stadium. Total cost is estimated at $11,000,000.

Hydro-electric project for African Gold Coast

The Gold Coast government has accepted a preliminary report by Sir William Halcrow and Partners, a firm of London consultant engineers, on its project for the development of the Volta River valley by the construction of one of Africa's greatest dams and an 800,000-kilowatt hydro-electric plant. The project, at Adjena about 65 miles from Accra, would provide electricity to produce aluminum from bauxite and replace all existing private and public power stations in the Gold Coast and in the neighboring Ashanti Province. Irrigation systems to make the Accra plains and other areas into food-producing areas are also proposed.

The report suggests that, if the manufacture of aluminum is to be the main outlet for the electric power to be produced, then the scheme would be economically justified. Two dam sites are being deep-drilled to help in arriving at a final decision.

Financing plan approved for Inter-American highway

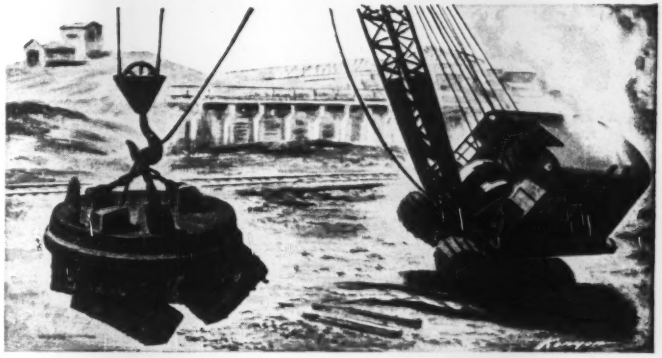
Plans for completing the financing of the Inter-American highway as far as Panama were approved at the recent Inter-American regional meeting of the International Road Federation in Mexico City.

Delegates representing national road associations in the United States, Canada, Mexico, El Salvador, Peru and Panama approved a plan proposed by Romulo O'Farrill, Sr., whereby necessary credits could be endorsed by the 21 American republics so that those countries needing additional funds could obtain them for the completion of their sections of the road.

Construction equipment at British fair

A comprehensive display of construction equipment will be included in the British Industries Fair. It will take place at Birmingham. The exhibit will be outdoors so that the equipment can be shown under actual working conditions.

Heavy world demand for construction equipment in recent years has caused a rapid expansion of the industry in Britain. In the exhibit there will be many highly mobile and fixed plants for concreting, earth moving, road construction and maintenance, pile driving, bridge and building works, and complete plant installations for the quarry and gravel industries.



How NOT to lose $4,099.85!

(Based on Hartford Claim #20216)

This crane operator was moving 800-pound bales of steel scrap when, unknown to him, the magnet picked up three bales instead of one!

Suddenly, the overloaded crane crashed on its side, bursting into flames from spilled gasoline!

The operator escaped serious injury, but the crane suffered a $4,099.85 damage before the fire was finally brought under control.

Fortunately, the owner was protected by a *Hartford Contractors' Equipment Policy*. Hartford paid his loss . . . permitting him to repair the crane and continue operations.

• • •

How about *you?* Damage to vital equipment often means *acute financial trouble*, sometimes a *halt in operations . . . unless* you are backed by Contractors' Equipment Insurance. Send coupon *today* for a sample policy and descriptive bulletin of this broad protection. Or see your Hartford agent or insurance broker. In more than 5000 communities you can locate your Hartford agent by calling Western Union by number and asking "Operator 25."

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FIRE INSURANCE COMPANY

Hartford 15, Connecticut

4

Please send sample policy and description of Contractors' Equipment Insurance.

Name_____

Firm Name_____

Address_____

City_____ State_____

When the going's rugged...

that Pioneer Edge

Contractor Praises Pioneer Equipment

It wasn't by accident that Winston Bros. chose a Pioneer plant to handle this rough, tough "Ridge Route" job. The firm is well acquainted with the advantages of Pioneer equipment. Just recently they told us, "We have three of your quarry and washing plants on our projects in Colombia, South America. Project managers report very satisfactory results with little delay caused by breakdown. This is very important because the equipment is so far from the source of supply."

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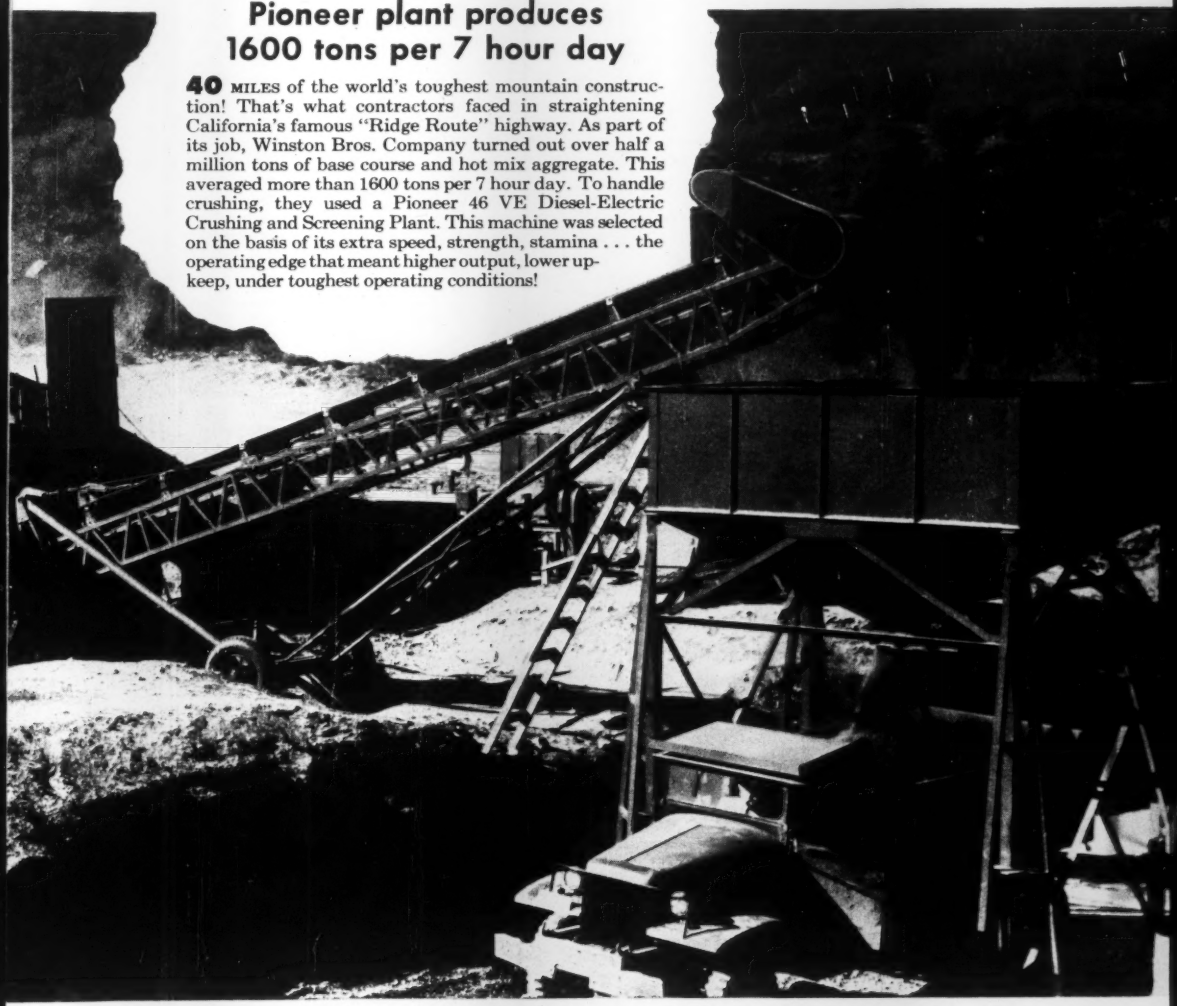
Pioneer plant produces 1600 tons per 7 hour day

40 MILES of the world's toughest mountain construction! That's what contractors faced in straightening California's famous "Ridge Route" highway. As part of its job, Winston Bros. Company turned out over half a million tons of base course and hot mix aggregate. This averaged more than 1600 tons per 7 hour day. To handle crushing, they used a Pioneer 46 VE Diesel-Electric Crushing and Screening Plant. This machine was selected on the basis of its extra speed, strength, stamina . . . the operating edge that meant higher output, lower upkeep, under toughest operating conditions!



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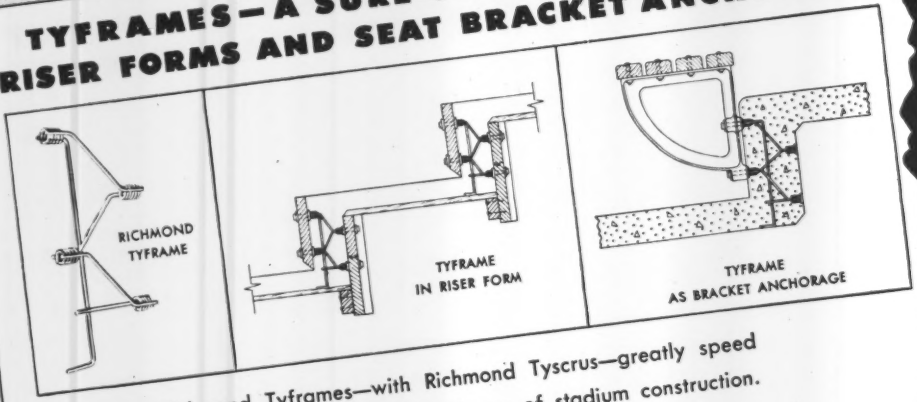
TYFRAMES—A SURE-FIRE SHORT CUT FOR RISER FORMS AND SEAT BRACKET ANCHORAGE



Richmond Tyframes—with Richmond Tyscrus—greatly speed and simplify two important phases of stadium construction.

This truss-like arrangement of wire struts, with a leg at the front face extending down to the soffit, supports the riser form rigidly and in exact position without the use of raking timbers or other external bracing.

This device is also highly desirable for anchoring seat brackets in poured concrete, as shown—also ideal for hanging steam and water pipes on concrete walls.

Get your "SCREWY" or "TY" button—write Charlie Snyder at Richmond, 816 Liberty Ave., Brooklyn 8, N. Y.

RICHMOND KNOW-HOW—DEPENDABILITY—SERVICE—ESTIMATES & JOB PLANNING

MUNICIPAL AFFAIRS

Widespread progress is evident in the modernization of building codes

Reports just received from various sections of the country indicate that rapid progress is being made in bringing building codes up to date. Changes are made necessary by new building techniques, and by the coming into use of some building materials that were not generally available when many of the existing codes were first put into effect. Examples of the new developments:

New York State—The New York State Building Code Commission has distributed copies of its proposed one- and two-family dwellings code, and a 280-page illustrated manual indicating acceptable construction methods and test procedure for alternate methods under the code. The commission expects to have its code analysis and recommendations completed in a few weeks.

A detailed description of the proposed state code will be published in the ENGINEERING NEWS-RECORD in the near future.

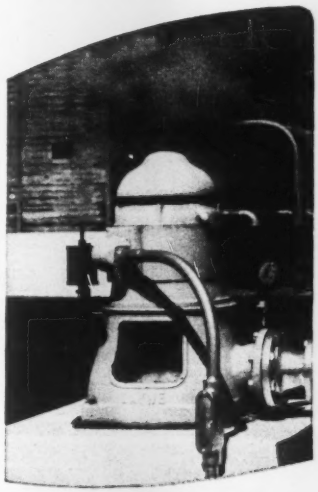
Iowa—The Iowa League of Municipalities, several state building organizations and other groups are pushing for passage of a state building code law. The measure proposes to create a state building code council to administer a state code setting up minimum standards for all types of construction except one and two-family residential units. Cities would be allowed to enforce local building codes containing stricter provisions than the state code if they so desired.

Youngstown, Ohio—Under the new building code which recently became effective here, any contractors who are tardy in applying for building permits will be charged double the normal permit fees. Permits must be obtained before construction begins, and if work is not under way 60 days after approval is given, or if work is suspended or abandoned for one year after commencement, permits are invalidated. Ninety-day extensions will be granted for a good cause but no refunds are permitted.

Providence, R. I.—The city is considering a new building code, which allows a broad range in the use of materials based on performance, and differing from the present code which stresses specifications. The existing code was written in 1927. The new standards embody the adaptation of

(*Continued on page 64*)

ENORMOUS TRANSFORMER—Two transformers like this, larger than any previously installed on the system, have been moved into the new $2,500,000 Broad St. substation of Seattle, Wash., City Light. Each unit weighs more than 100 tons stripped and has a rated capacity of 50,000/62,500 kva. Power received at 115,000 volts will be reduced by these three-phase transformers to 26,000 volts for dispersion to distribution substations in the central district area. The transformers were made by the General Electric Co. at a cost of $484,500. Each was transported by rail to Seattle on four cars, one for the 20x15x10-ft. stripped transformer and three for the accessories. Initial installation at the substation will include 24,000 kva of distribution capacity to serve the surrounding area and 3,000 kilowats of mercury-arc rectifier capacity to supply 600-volt direct current for the Seattle Transit System.



THEY'RE WORKING

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A lot of new Layne wells and pumps are serving the big inch pipelines,—and more are being installed. The selection of these fine water supply systems was based on such features as;—basically sound engineering ideas, higher overall efficiency, top flight quality,—and their ability to handle peak production on an around the clock schedule. Installed by Layne's own field crews and according to Layne's rigid standards, they will give years and years of fine service with little or no upkeep expense.

Layne is the Nation's greatest organization engaged exclusively in the designing and building of modern high efficiency well water systems. Layne has made more installations than any other firm in the world and is widely recognized as being the best qualified for any size job from a single unit to a dozen—or even hundreds. If you need more water, contact Layne or send for new catalogs or bulletins. Address

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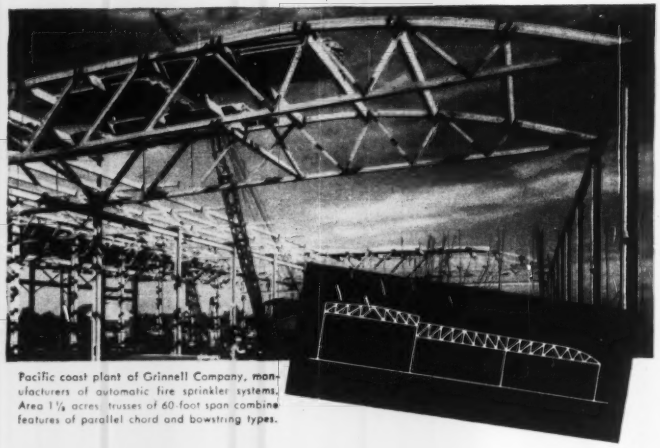

Pacific coast plant of Grinnell Company, manufacturers of automatic fire sprinkler systems. Area 1⅛ acres; trusses of 60-foot span combine features of parallel chord and bowstring types.

Skeleton of a Production Tool

TRUSSES of engineered timber provide the expanse of open floor space which will make this building a primary production tool. Unhampered by an excessive number of interior posts, continuous flow of mass production is possible; materials handling equipment functions efficiently; flexibility is retained for expansion, changes of tenants, and new production processes and machinery.

Wide Range of Adaptations

Trusses in this building are typical of the adaptability of Timber Structures units. Other types provide saw tooth, flat or arched roof contours, or any desired combination of these forms. Spans may be up to 250 feet or more, and number of spans is limited only by site conditions. Local loadings such as mezzanines, balconies, monorail installations and heating and cooling units are readily accommodated in design.

Resistive to Destruction by Fire

Truss chords shown here are formed by glued lamination into single piece members, permanently free from seasoning action, and qualifying as heavy timber or mill type construction. They are naturally resistive to failure by fire and earn moderate insurance rates.

For additional information about these structural units, get a copy of the booklet, "Industrial Buildings" from your nearest Timber Structures representative, or fill in and mail the coupon.

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the model code of the Building Officials Conference of America, Inc. In effect, the new code opens the door to the intelligent use of new materials, while the old code was restrictive in its approach to construction. The new code does not let down the bars to cheap and unsafe construction. All materials must meet high standards.

Marion, Ind.—When it went into effect last year, a new building code at Marion met with considerable opposition, but it has worked out so well in actual practice that now there is very little adverse criticism. According to Oscar E. Silver, building inspector, when the real purpose of the code is explained to a builder he is no longer antagonistic. After he has had his structure inspected as often as 15 times before completion, he believes that he has obtained some real service for his investment. Administering the ordinance has resulted also in greatly increased revenue for the city.

New housing code—Major clauses of the new housing code likely to go into effect at Minneapolis, Minn., in time for the summer construction season are these: No multiple dwellings are to be permitted on lots less than 42 ft. wide, as against the old limit of 40 ft.; house lots must provide at least 5 ft. side yards; multiple dwellings must have a minimum of 7 ft. sideyard on each side for two-story structures; 9 ft. for three-story structures, and an additional 2 ft. for each additional story up to six; court structures would be permitted, entrances to face an open court provided the court itself is open to the street; in multiple dwellings, basement occupancies are to be permitted provided the dwelling units qualify in respect to light, air and sanitation.

Install progressive lights on 125 St., New York

A progressive signal system has been put into effect on 125th Street, the main street of Harlem, N. Y. City. It was the first crosstown street in the Metropolis to receive the speed-up treatment.

According to traffic engineers, the new plan saves motorists using the street an average of three minutes. The new system provides for progressive changes set for a speed of 23 miles and hour. Normally a car should travel 13 blocks without stopping.

J. T. Wiley, deputy traffic engineer and head engineer of the department, says it is hoped to install progressive signals later in the year on 14th, 34th, 42nd and 57th Streets.

(*Continued on page 66*)

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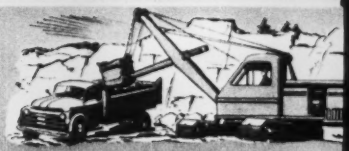

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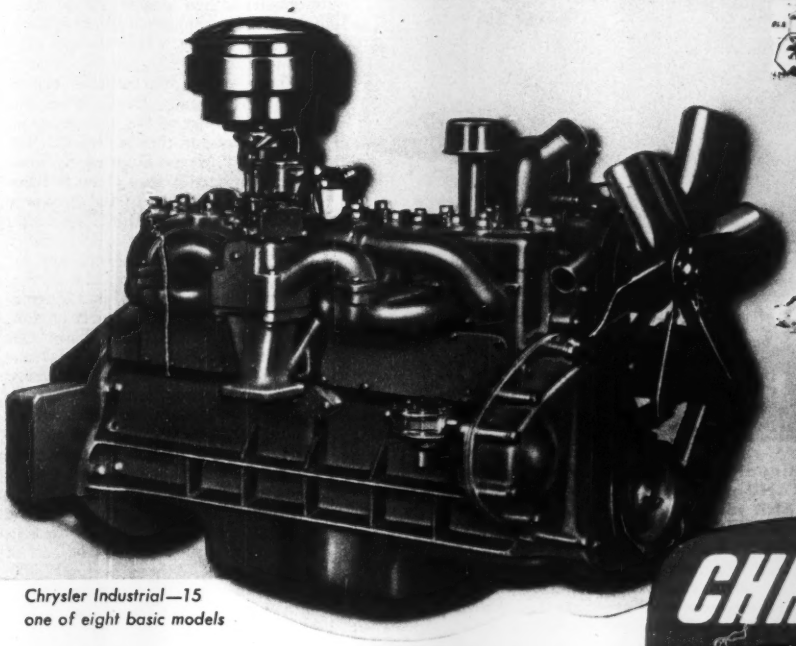

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General Electric sues city for $165,000 taxes paid

The pending suit against the city of Everett, Mass., for recovery of $165,000 in taxes by the General Electric Co. will go to the United States Supreme Court if necessary, it is now indicated. That is the opinion of Mayor Philip J. Crowley and City Solicitor Harris E. Albert, following a conference with General Electric counsel and representatives of the Air Force and United States Attorney General.

The case involves the right of a Massachusetts municipality to tax property owned by the United States Government but leased to a private corporation which makes a substantial profit on it, City Solicitor Albert said.

The property in question is the General Electric jet engine plant. Mayor Crowley said the taxes involved already would mean a difference of $1.60 in the city's tax rate. He added that the property, valued at $2,000,000 would be a "tough loss" for the city after it had already lost $3,000,000 in Metropolitan Transit Authority property, which is no longer subject to taxation.

The General Electric Co. claims that it is illegally taxed, since the property belongs to the United States Government and thus is exempt. But Albert and Mayor Crowley declared at the conference that General Electric leases the property and derives a substantial profit from it.

Municipal Briefs

Joint sewage survey—Four Virginia communities—Alexandria, Arlington, Fairfax and Falls Church—have been asked to authorize a $30,000 joint survey of their sewage disposal problems. An interim committee on sewage appointed last December has a choice among three engineering proposals. The committee has recommended that Alexander Potter Associates of New York and Greely & Hansen of Chicago be employed for the survey. The committee has agreed on how the four communities should share the cost of the survey: Alexandria, $12,000; Arlington, $12,750; Fairfax, $4,500; and Falls Church, $750.

Capital improvements—The Durham, N. C., city council has called for a referendum on proposals to issue 6,100,000 worth of bonds for capital improvements. Included is $2,225,000 for sewer plant improvements; $500,000 for additional sewer lines; $1,500,000 for water department projects; $750,000 for street paving; $500,000 for a new police building, $200,000 for

new fire stations, $185,000 for construction of new stadium stands; $100,000 for sidewalks; and $140,000 for recreation improvements.

A $42,000 saving—Pulaski, Wis., last year voted to build a school gymnasium and auditorium. The lowest bid received was $141,500. Pulaski decided that was too high. The bid was rejected. With Principal F. X. Joswick and Peter Mroczynski supervising, local laborers were used and all materials were bought directly. So far the cost has been $99,335, saving taxpayers $42,165.

Generous citizen—At Pryor, Okla., there was a demand for municipal ownership of the local electric light plant operated for many years by the Public Service Co. of Oklahoma, to be bought at a cost of $180,000. W. A. Graham, aged 97, offered to give the city $100,000 for the purpose. A bond issue carried and the remaining bonds necessary were sold, but litigation attacked the election. Then Mr. Graham gave the city the remaining $80,000. This stopped the litigation and the city has acquired the property.

Water main flood—A break in a 10-in. primary water main recently flooded almost two blocks of South Walnut and West Jackson Streets in Muncie, Ind., sending water rushing into basements of a dozen retail stores. More than 91,000 gal. of water poured through the break before it could be turned off. The break resulted when a leak in a small service pipe washed away the earth supporting a fire hydrant.

Good planning—Athol, Mass., has been awarded a certificate for an outstanding planning board report. The award was made by the Massachusetts Selectmen's Association and the Bureau of Public Administration of the University of Massachusetts. The 27-page report contains a number of charts and graphs pertaining to town finances, and features a capital outlay program for the years 1951-56.

No cheaper water and sewer rates—Officials of Montgomery County, Ohio, have petitioned the city of Dayton for cheaper water and sewage rates. At present county users pay 25 percent more than city users, and the county maintains its water and sewer lines. There is a possibility that the county may construct its own sewage disposal and water plants. City Manager Russell McClure says that nothing can be decided on the water rates until the city completes a cost survey begun nearly a year ago.

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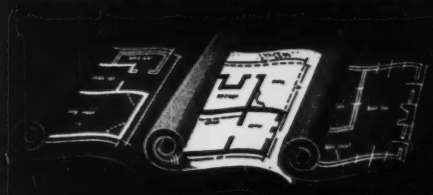

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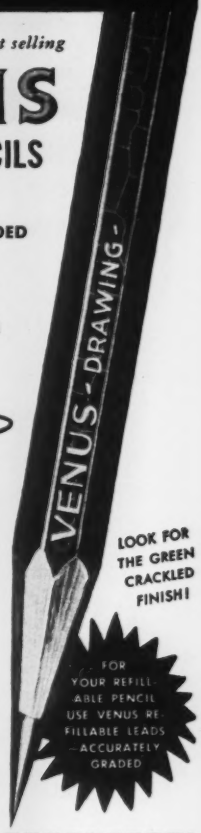

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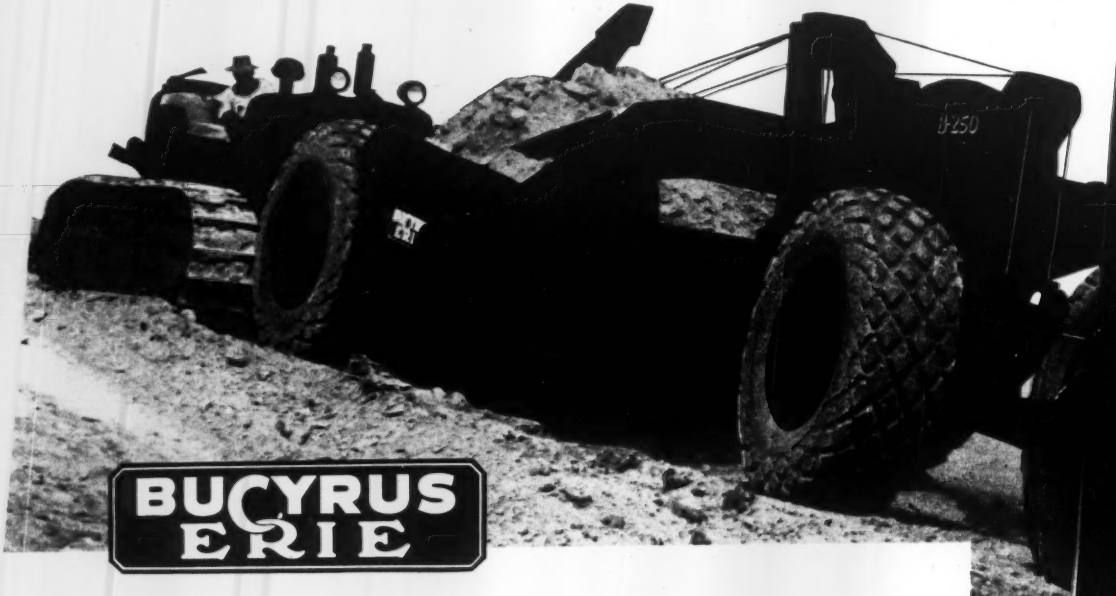

BUCYRUS ERIE

BLUE shale so hard it often had to be shot and ripped before loading . . . scraper maintenance costs way up, yardage output down . . . pushers not used to avoid damage to scrapers. That was the picture on a tough highway job until one of the contractor's International TD-24 Tractors was teamed with a Bucyrus-Erie B-250 scraper. Look what happened when the Big Red team went into action.

On a 60-day run, this 22-yd. outfit not only scraped out heaping loads of shale, but did it without blasting. Big Red team loads averaged 13.5 to 20% higher than competitive units — and two of these scrapers had greater apparent rated capacities than the B-250. Loading time of the B-250 averaged 1¾ minutes with a pusher. In spite of heavy shock loads, the B-250 showed no signs of failure.

This is one of many jobs on which the Big Red team has performed with complete satisfaction to the owner. Performance details on this job, or any other job on which records have been carefully compiled, are yours for the asking. Study these records . . . and let us demonstrate the Big Red team *on your own job*. Then you'll have convincing proof that this combination gives you the ultimate in crawler tractor earthmoving performance.

BUCYRUS-ERIE COMPANY

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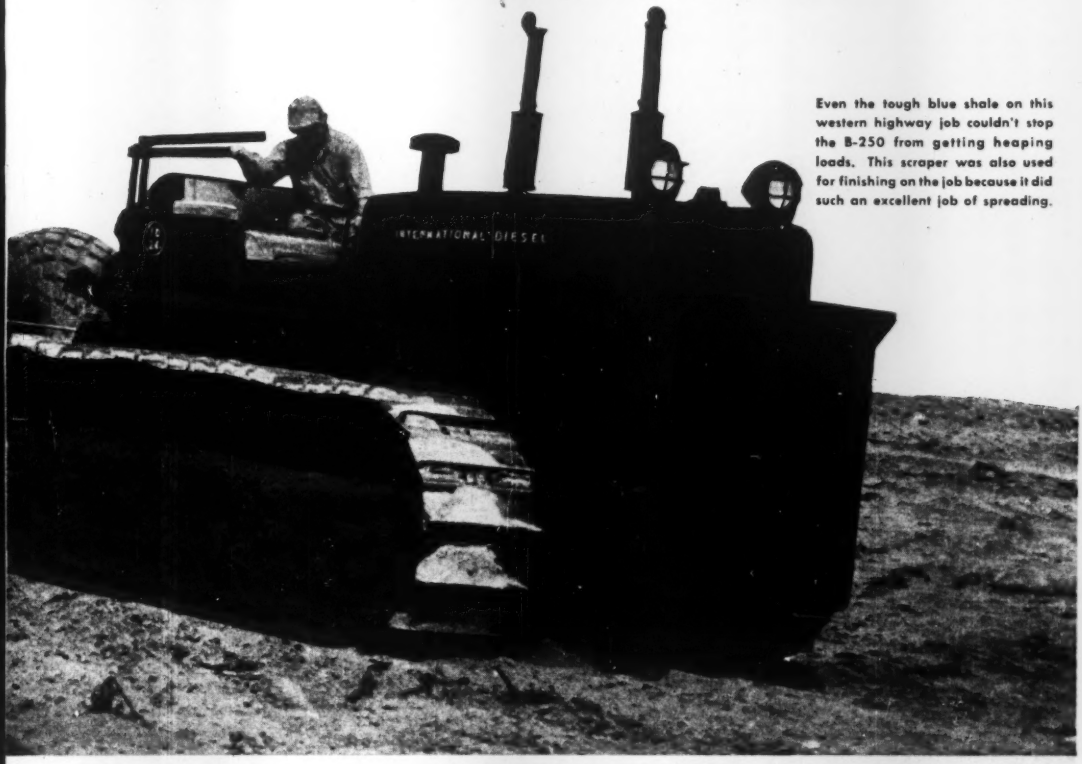
TEAM

On Million-Yard Highway Project



Even the tough blue shale on this western highway job couldn't stop the B-250 from getting heaping loads. This scraper was also used for finishing on the job because it did such an excellent job of spreading.

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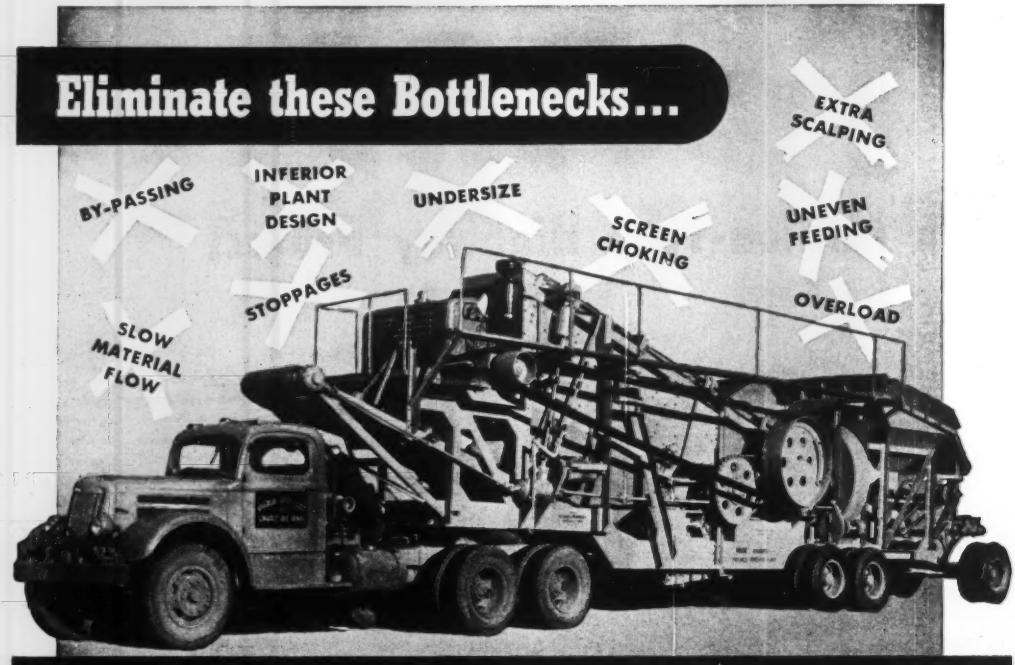

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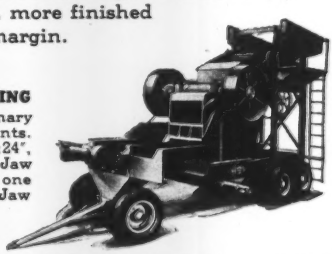
Write today . . . for full information on Diamond Plants—built to keep you in business at a profit. Ask for Rotor-Lift Plant Bulletin D-51-G —Quarry Plant Bulletin D-51-A.

DIAMOND'S LINE-FLO PRINCIPLE of aggregate production—characteristic of all Diamond Plants—gives a continuous capacity operation of uniform product at lower ton cost. Five size Portable Rotor-Lift Plants, with capacities ranging from 30 to over 200 cubic yards per hour, will handle your every material processing need. You can bank on a Diamond Plant—regardless of the job—for more raw material input . . . more finished product output. . . more profit margin.

DIAMOND *Portable* PRIMARY CRUSHING PLANTS are called on for really rough primary rock busting . . . feed to the Rotor-Lift Plants. Five size Primary Plants available with 15" x 24", 15" x 36", 20" x 36", 24" x 36" and 30" x 42" Jaw Crushers. Diamond's #30 Primary Plant is one of the few produced with a 30" x 42" Jaw Crusher.



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MEN AND JOBS

New Appointments

Highway departments

L. S. Hill, asst. supt. Duncan div. Oklahoma highways.
Ray T. Best, resident engineer Shawnee, Okla.
J. J. Pollitte, chief zone location engineer, Lexington, Ky., State highway dept.
A. W. Joseph, div. engineer, Sussex County, Delaware state highways.
Wm. A. Bailey, dist. construction engineer Washington state highways, Vancouver, Wash., **Robert L. Dean,** dist. maintenance engineer; **W. B. Munson,** office engineer; and **E. E. Nielson,** location engineer.

Municipal and county

I. N. Koontz has joined the city public service department at Greensboro, N. C., as an engineer.

Industrial and commercial

Don H. McCreery, special engineering asst. to president, Holmes & Narver, Inc., Los Angeles, Calif.
Franklin Way, asst, to president, Durham and Southern and Piedmont and Northern Railway, Charlotte, N. C.
Eugene A. Hardin, staff of Parsons, Brinckerhoff, Hall and Macdonald, New York City, in group headed by G. Gale Dixon and including Frederic C. Rudolph, water supply and sewerage.

State, city and county

John P. Larsen, asst. dist. engineer, N. Y. State Dept. of Public Works, Rochester.
John Nolen, Jr., director of National Capital Park and Planning Commission, Washington, D. C.; Blain Lee 3d, exec. asst.
Herbert H. Metz, Jr., junior sanitary engineer, Pennsylvania Dept. of Health.

Retirements

Evans H. Hunt, div. engineer, Upper Mississippi Valley div. Corps of Engineers 40 years.
Miss Dixie L. McCrary, Office of the Chief of Engineers 33 years.

Government agencies

James R. Johnston, sec'y, New England-New York Inter-Agency Committee.

Bureau of Reclamation

Following are being transferred from Shadehill Dam, Lemmon, S. D.: To Huron—**D. M. Forester, J. L. Baugh, H. J. Barber, M. O. Baugh,** and **R. M. McGinnis.** To Watertown—**R. C. Brown, P. Hardin, R. C. Boyd, J. J. Ross, W. L. Armstrong** and **G. O. Snow.** To Sioux Falls—**G. W. Stocking.** To Hungry Horse Dam, Mont.—**D. W. Sconlar;** to Keyhold Dam, Wyo.—**M. J. Sowell, R. L. Thompson, C. W. Fulmer, A. J. Olien** and **J. E. Cross.** To Canyon Ferry Dam, Mont. —**C. G. Hayenga** and **R. E. Morris.** To Angastura Dam, S. D.—**E. E. Kline. A. W. Zimmerman,** Sacramento Valley, Calif., dist. planning engineer.

Newfoundland government

E. Jacobson, bridge engineer, to design bridges on the Newfoundland div of the Trans-Canada road.

Consulting engineers

Percy L. Coleman, chief structural engineer, **C. J. Smith & Co.,** consulting engineers, St. Louis, Mo.

Corps of Engineers

J. G. Surratt, Wilmington, N. C. Dist. office.
Lt. Col. L. W. Carrell, exec. officer North Pacific div.

Honors

Carl Brown, chief engineer, Missouri State Highway Commission, and **Wm. V. Kahler,** president, Illinois Bell Telephone Co. received medals of honor at the University of Missouri, recently for distinguished service to engineering.

Karl R. Kennison, Newton, Mass.; former chief engineer of the Massachusetts Metropolitan Dist. Water Supply Commission will receive the annual New England Award of the Engineering Societies of New England, and he has been made an honorary member of the Boston Society of Civil Engineers.

Blake R. Van Leer, president of Georgia Institute of Technology, made a Fellow of American Society of Mechanical Engineers.

Marcel Golay, a chief scientist of the Signal Corps Engineering Laboratories, Fort Monmouth, N. J., received the Harry Diamond Memorial Award for outstanding publications contributions in radio and electronics.

Ralph E. Davison, left, has been appointed manager of General Electric's newly-established Engineering & Construction divisions at Hanford Works, Richland, Wash., John S. McMahon, right, is assistant manager. They will direct a $100,000,000 construction program now in progress at the works.

B. J. Connolly, left, is superintendent for Grove, Shepherd, Wilson Kruge, Inc., contractor on the Nassau County, N. Y., $25,000,000 sewage treatment plant nearing completion at Bay Park. With him is Charles Kirsner, inspector for the county Department of Public Works.

Past president Donald E. Reed; left, welcomes new President Ben P. Griffith, right, of the Southern California AGC chapter at installation ceremonies. Griffith is executive vice-president of the Griffith Co. one of Los Angeles' oldest construction firms. He now heads the largest of the national association's 112 chapters throughout the U. S.

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MODEL A

"Berg"' equipment is used extensively for surfacing and finishing applications on concrete construction.

The many "BERG" Models available, permit exact selection for your particular application.

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EDUCATION, RESEARCH

Electric-fluid analyzer is commercially produced

The first commercially-manufactured electric analyzer for pipeline networks has been produced by Standard Electric Time Co., Springfield, Mass., and sold to Washington State College, Pullman, Wash.

Inventor Malcolm S. McIlroy, professor of electrical engineering at Cornell University, conducted a recent demonstration of his device for measuring fluid flow and pressure distribution in complex pipe networks at the Springfield manufacturing plant. Prof. Charles L. Barker of Washington State, in whose hydraulics courses and research the machine will be used, was among those who witnessed the demonstration.

The machine makes use of electrical analogies in solving hydraulics problems (ENR Sept. 22, 1949, p. 19). It relates current to fluid flow and voltage to friction head loss. It recognizes the principles of balanced flow at junctions and addition of head losses as applying to both electricity and fluids.

For his paper on the subject, published in the April, 1950, JOURNAL, AMERICAN WATER WORKS ASSOCIATION Professor McIlroy won AWWA's John M. Goodell Prize for the outstanding contribution of 1950 to the waterworks field. He has assigned his patent rights to the Springfield firm.

New construction course at Univ. of California

On-the-job training for construction engineers will be part of a new construction course at the University of California under a bill before the California legislature.

The construction engineering section of the University's School of Engineering would be increased to a five year course. During the second, third, and fourth years in school, students would alternate every six months between working on local construction projects and attending classes, thus giving construction engineering graduates 1½ years working experience.

Funds for a full-time professor in construction education would be provided in the measure before the legislature. The bill is sponsored by the Central California Chapter of Associated General Contractors whose members will provide jobs for students on such projects as engineering, building, dams, roads, and bridges. Students will be paid union wages.

A field supervisor from the university will maintain contact with working students and bring back to the classroom problems and case materials from the projects.

Increased enrollment of students in construction engineering would be possible since part of the students would be in the field at all times.

Study made of bamboo for reinforcing concrete

Three Indian construction engineers have recently published results of an investigation in the use of bamboo for reinforcing concrete.

The idea is not new, but has previously not proved practicable because bamboo when conjoined with wet concrete can absorb up to 300% of its own weight of water, increasing commensurately in volume at the same time.

The Indian investigation at the Forest Research Institute, Dehra Dun, has concentrated on coating the bamboo with a variety of different compounds. The most effective waterproofing agent was bound to 40% rosin in alcohol with a subsequent coat of white lead, which resulted in a moisture absorption of only 1% in 24 hours. With a double coat, absorption was brought down to 0.3%. It was further discovered that with a percentage absorption of 0.3 the increase in the volume of bamboo is almost negligible.

The bamboo tested had a modulus of rupture in bending and a tensile strength of 14,000 psi.; a modulus of elasticity of 2.4×16^6 psi and a crushing strength of 6,500 psi.

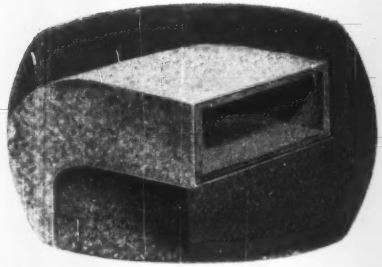
Industrial acoustics—There will be a special program in acoustical treating and processing at the Massachusetts Institute of Technology, June 18-22 next. The course will be given by Richard H. Bott, director of the M.I.T. acoustics laboratory. Main topics are sound wave propagation, transducers for sound generation and reception, analysis and testing of solids, measurements of molecular properties of fluids, and uses of acoustic power in industrial processing.

Residential construction – A new course in residential construction, organized by Joseph A. Minihan of the Department of Education, is being offered at the Massachusetts Institute of Technology. It is a practical study of common problems in that field, and a discussion of preferred construction, methods and materials.

(Continued on page 74)

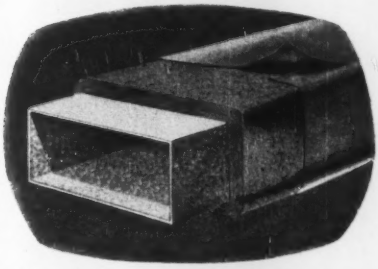
4 popular uses for ULTRALITE

The LONG glass fiber insulation!



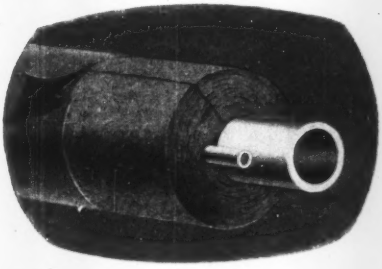
ULTRALITE—the duct liner that won't burn!

Ultralite Duct Liner is a flexible, semi-rigid glass fiber insulation designed specifically as an acoustical duct liner, with excellent sound-absorbing properties. It won't break, chip or delaminate—won't flake off in air stream! You can run it quickly around curves and corners, run it through the brakes and shears with the metal, fasten it in place with screws and washers or adhesives.



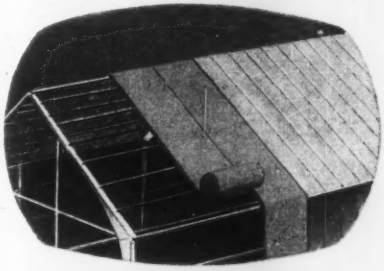
ULTRALITE—the easy-to-install duct insulation!

It's "duct soup" to wrap air ducts with Ultralite Thermal Duct Insulation—it's as easy as wrapping a package! Ultralite Duct Insulation is available plain or with your choice of 4 different vapor barrier facings, already adhered to the insulation. Ultralite is non-irritating, pleasant to handle, fire-resistant and non-corrosive to metals. K-factor is very low—and so are applied costs!



ULTRALITE—for general piping applications!

For a smooth, neat wrapping job on pipe from 1½" up, where surface temperatures do not exceed 425° F., try Ultralite! Goes on quickly, especially around valves and fittings; stands up under bumps and rough usage without breaking or losing thickness. Saves money, too—applied costs are only ⅔ that of hemi-cylinder pipe insulation for weatherproofed outside lines! Available with vapor barrier or weatherproof facings already attached.



ULTRALITE—perfect for metal buildings!

Wherever there's a place for metal buildings that need insulation, there's a place for Ultralite. No need to fasten it in place if you insulate when the building is erected; simply apply Ultralite between metal skin and structurals, and its resilience keeps it in place . . . permanently! Available with 4 attractive vapor barrier facings, already adhered to the insulation.

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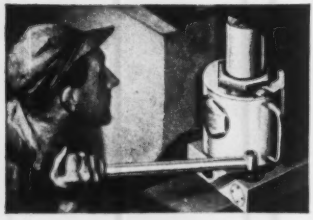

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Look at this picture! *One man* with easy effort on a *short handle* exerts 100,000 lbs. of jack action! This hydraulic jack (model GB-11) weighs only 111 lbs. Its compactness and many exclusive features are typical of all Blackhawk Jacks.

THERE'S A BIG DIFFERENCE IN HYDRAULIC JACKS! Construction, mining and industrial men discover that Blackhawk Jacks last longer, serve better. It's the world's most complete line of Hydraulic Jack Equipment. And every model (1½ to 100-ton) is *one-man* operated. Order from your supply house. Write for catalogs. Blackhawk Mfg. Co., Dept. J-3651, Milwaukee 1, Wis.

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Standards Bureau tool measures salt in rivers

A salinity meter useful in checking salt intrusion in fresh water channels has been designed by Garbis H. Keulegan of the National Bureau of Standards.

Primarily a laboratory measurement device, the meter is said to be adaptable to location of salt fronts and measurement of salt dispersion near mouths of rivers.

Electrical conductivity (and its variation with salinity) is the principle on which the meter operates. Resistance of two parallel wires submerged in an electrolytic solution is a function of the conductance of the solution-length, spacing and diameter of the wires being constant. By lowering the meter with its two electrodes through a depth of water at a constant rate of speed, variations in conductivity—and thereby, salinity—can be traced on an oscillograph recorder. Thus salinity in a vertical section of channel can be plotted.

One-day conference on re-inforced concrete

On Saturday, May 19 from 9.30 A.M. to 5.15 P.M. there will be held on the University Heights campus of New York University a one-day conference on "New Developments in Reinforced Concrete." Prof. R. L. Lewis of the college of engineering will preside.

The papers will include: "The Walnut Lane Bridge" by John Hogan, regional structural engineer, Portland Cement Association; "Concrete Shells and Arches," Prof. W. A. Rose, Lorimer & Rose, presiding; "Precast Concrete," E. H. Praeger, Madigan-Hyland, presiding; "Modern Developments in Precast Concrete," Louis P. Corbetta, Corbetta Construction Co.

Further particulars from Chas. D. Morrissey, Dept. of Civil Engineering, New York University, New York 53, N. Y.

Technicians wanted—There are more than 300 civilian positions open for engineers and other technical personnel at the Army Engineer Research and Development Laboratories, Fort Belvoir, Va. Included are civil, cartographic and photogrammetric engineers, technical writers, architects, draftsmen, surveyors, model makers, equipment operators and others. Under civil service regulations, the salaries are up to $6,400 per year. Write to Col. O. B. Beasley, Commanding Officer, Engineer Research and Development Laboratories, Fort Belvoir, Va.

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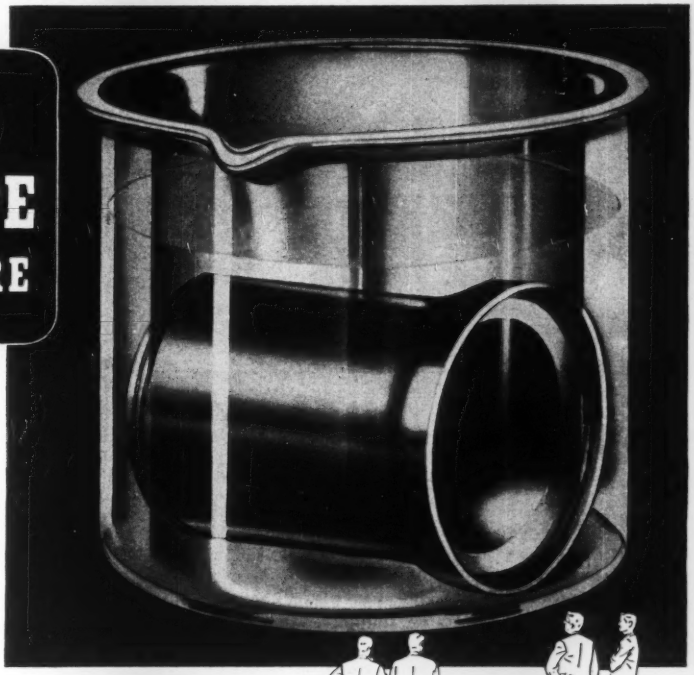

CLAY PIPE IS THE *ONLY* PIPE THAT INCLUDES ACID TESTS IN ITS A.S.T.M. SPECIFICATIONS

When you write Clay Pipe into your specifications you've given the best guarantee in the world that the pipe will outlive for years, and even centuries, the investment in the project. The clay itself is chemically inert. By the Clay Pipe Industry's exclusive process of VITRIFICATION, the material is fired and bonded together into the only pipe known that maintains its resistance to corrosion forever. In addition to these basic, unmatched qualities, careful controls over each operation give you denser, stronger, better Clay Pipe — of *uniformly* high quality. You can specify Clay Pipe with confidence, secure in the knowledge that Clay Pipe does not disintegrate from acid attack — that it *never wears out.*

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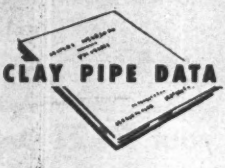
SPECIFY *Vitrified* CLAY PIPE



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Additional information and data on Vitrified Clay Pipe, Wall Coping and Clay Flue Lining sent FREE on request. State your specific questions. Simply contact the regional office nearest you.

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MEETINGS

The Mountain Pacific chapter of the A.G.C. at Seattle, has elected T. H. Youell president; Don L. Cooney, vice president; and Alex McEachern treasurer.

D. L. Cheney is president of the Alaska chapter, A.G.C., A. M. Strandberg vice-president, and John Grove secretary-treasurer. Directors, G. E. Lefler, C. W. Hufeisen, M. P. Munter and D. W. Clayton, and R. H. Stock representative on the National Board.

Jerry Allen has been elected president of the Seattle Engineers Club, Roy L. Gardner, vice-president, Evans K. Blackford secretary and W. G. Carr treasurer. Trustees Mike Anderson, P. N. Royal, J. L. Bannon, H. H. Edwards, A. P. Jentoft, E. T. Norman, William J. Royea, J. D. Taylor and R. I. Woglum.

James Cullen was elected president of the Allied Construction Industries of Delaware, John E. Healy II, vice-president; William C. Ward, treasurer; Francis E. B. McCann, executive vice-president and secretary. Directors; Arthur Carota, James P. Robbins, Graydon Hurst, William Shinn, Arthur Pavoni, Jr., Francis M. Gardner, E. Price Lowe, Joseph T. Ward, Samuel McCormick, William E. Savery, Calvin Hastings, Herbert F. Weldin, Robert H. Armstrong and Oscar S. Talley.

M. O. Branton is president of the Arkansas chapter of the Associated General Contractors of America. Artie Gregory, first vice-president; J. K. Fraser, second vice-president; and Ray Metzger, secretary-treasurer. Directors, Herman Garty, Phil Baldwin, Jr., S. M. Dixon, G. W. May, D. B. Hill, Jr. and Gordon M. McNulty.

Cornelius M. Shannahan has been appointed executive secretary of The Cement League of New York City, an organization of 39 contractors specializing in concrete construction. Mr. Shannahan continues as secretary of the Building Contractors' and Mason Builders' Association, a position he has held for 11 years.

Michigan Chapter of Associated General Contractors of America, has elected these officers: President, C. E. Bottum, Ann Arbor; vice-president, Ralph O. Dunn, Grand Rapids; secretary, Waldon Allen, Lansing; treasurer, Henry A. Reniger, Lansing; directors, Harry L. Conrad, Lansing; and E. A. Schillinger, Benton Harbor.

Ray F. Smock, Pennsylvania Secretary of Highways, has been reelected president of the Association of Highway Officials of the North Atlantic States. New Jersey Highway Commissioner Ransford J. Abbott was named vice-president and A. Lee Grover of the New Jersey Highway Department secretary-treasurer.

The officers of the Illinois Society of Professional Engineers, Inc., are: Virgil E. Gunlock, president; A. Douglas Spicer, vice-president; George E. Ekblow, post president; H. E. Babbitt, secretary-treasurer; W. A. Oliver, editor; P. E. Roberts, assistant secretary.

The Tacoma, Wash., chapter, A.G.C., has elected Lige Dickson, president; Roy T. Earley, vice-president, and P. F. Stevens treasurer. Contractor members elected directors for the building division are L. B. Macdonald, J. W. Purvis, Roy Hartman, William E. Goettling, and George Barr. Representing the heavy construction division are George Mason, Earl Shipley, J. A. Woodworth, A. S. Macdonald and J. A. Harrison.

CALENDAR

Column Research Council, Engineering Foundation, Engineering Societies Bldg., N. Y. City, May 10-11.

N. Y. State Society of Professional Engineers, Silver Anniversary, Hotel Statler, N. Y. City, May 10-12.

Building Officials Conference of America, King Edward Hotel, Toronto, Ont., May 14-17.

Society for Experimental Stress Analysis, spring meeting, National Bureau of Standards, Washington, D. C., May 16-18.

Pacific Northwest Sewage Works Assn., Hotel Vancouver, Vancouver, B. C., May 17-19.

Pacific Northwest Section, AWWA, Hotel Vancouver, Vancouver, B. C., May 17-19.

Pennsylvania Society of Professional Engineers, Americus Hotel, Allentown, Pa., May 18-19.

Canadian Section, AWWA, Royal Alexandria Hotel, Winnipeg, Man., May 21-23.

Conference on Industrial and Plant Protection, N. Y. University, Washington Square Center, N. Y. City, May 22-24.

New England and New York Sewage Works Associations, spring meeting, Hotel Kimball, Springfield, Mass., June 7-8.

President's Highway Safety Conference, Washington, D. C., week of June 10.

National Society of Professional Engineers, annual meeting, Nicolet Hotel, Minneapolis, Minn., June 13-16.

American Congress on Surveying and Mapping, annual meeting Hotel Shoreham Washington D. C. June 18-20.

American Society for Testing Materials, Chalfonte-Haddon Hall, Atlantic City, N. J., June 18-22.

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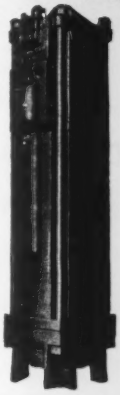

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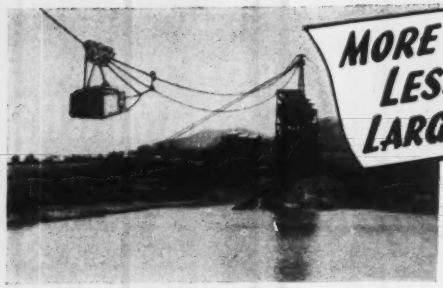

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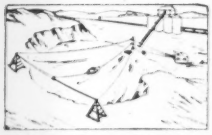
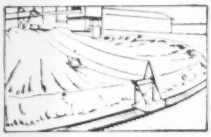


Sauerman Scraper Excavator



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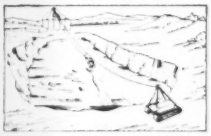
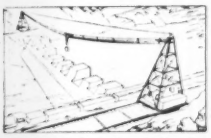
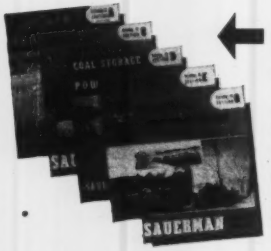


Sauerman Slackline Cableway



Sauerman Tautline Cableway



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OBITUARY

Lieut. Col. Howard J. Lowe, 39, former executive officer of the U. S. Corps of Engineers, Buffalo, N. Y., District, and for 13 months chief of construction of the Erie, Pa., Veterans Hospital, was killed in an automobile accident in Merrifield, Va., April 1.

Carl F. Steinle, 72, partner in the Steinle-Wolfe Construction Co., Fremont, Ohio, for many years, until his recent retirement, died March 31.

Myron H. Miller, 56, head of the Myron H. Miller Co., Toledo, Ohio, construction firm, died April 2. He was associated with the late Ed Voss in construction work in Toledo 30 years, and had been in charge of the business the last eight years.

Robert P. Garrett, 79, vice-president and treasurer of the Missouri Bridge & Iron Co., St. Louis, Mo., died April 5. He founded the company in 1902 with his brother, John T. Garrett, now president of the firm.

Lloyd M. Hawkins, 48, vice president of the Hinman Brothers Construction Co., Denver, Colo. died in Boulder, Colo., April 9. He was employed as a soil engineer for the Colorado State Highway Department for many years.

Col. Herbert T. Knapp, 57, former Air Transport Command engineer, whose work included the design of air bases around the world, died at Memphis, Tenn., April 12. Between wars he served with the U. S. Engineers in the Memphis district. He directed the rehabilitation of Japanese air fields for the occupation forces, and in 1947 he was staff engineer of the 13th Air Force in the Philippines.

Ben Hayes Collings, 61, engineer and road contractor in Kentucky for 26 years, died in Louisville April 3. He was president of the Louisville Sand & Gravel Co. His firm supplied concrete for the expansion of Fort Knox in World War II.

C. L. Joliff, 41, engineer for the Nebraska board of control, died March 30.

John W. Gotwals, Sr., 65, retired engineer of the E. I. du Pont de Nemours and Co., died April 11 in Bellefonte, Del. Before retiring in June, 1949, Mr. Gotwals was a senior supervisor in the engineering depart-

ment of the company's Chambers Works at Deepwater Point, N. J. During World War I, he was assigned to a number of construction and engineering projects at Parlin, N. J., Carney's Point, N. J., and Old Hickory, Tenn.

George H. Sanborn, former deputy commissioner of Public works in Syracuse, N. Y., for 13 years, died April 10. He also had served as superintendent of the buildings for the city of Syracuse.

L. Buyers, 60, explosives specialist, and president and general manager of Shaped Charge Explosives Mfgrs. Inc., of Martinsburg, W. Va., died there April 11.

P. B. Kraut, 73, inventor of the wirelock clamp to join high-tension wires, died April 13 at Narberth, Pa. His first work was as construction engineer with E. I. du Pont de Nemours and Co. Inc. From 1907 to 1929 he was with the Pennsylvania R.R. and supervised much of that railroad's electrification work. From 1929 till his retirement in 1938 he was with Vare Bros. contractors.

Frederick G. Riesen, 66, a retired contractor of Milwaukee, Wis., died April 10 at Oconomowoc, Wis. He had been an officer of Paul Riesen & Sons Co., which built many of Milwaukee's schools and larger buildings.

Mortimer W. Smith, former chief engineer for the West Virginia state road commission and Clarksburg city engineer, died April 10 at Clarksburg. He was a veteran of World Wars I and II and was prominent in engineering circles throughout West Virginia.

Joel W. Mills, 76, former engineer of Martin County, Minn., died recently in Van Nuys, Calif.

Owen M. Jones, 73, construction engineer, died April 7 at Glen Ferris, W. Va. Chief engineer for the Union Carbide and Carbon Co., he was the designing and supervising engineer of the Hawk's Nest hydroelectric power development. A graduate of Vanderbilt University, 1900, he taught in the engineering schools at Tulane and Syracuse universities.

Carl Lund, former water director for Buffalo, N. Y., died April 9. He joined the Buffalo Public Works Department in 1898, became assistant engineer in 1908 and a civil engineer in the water department in 1910. He had retired 18 years ago.

High heating costs took a real body blow in this Western Pennsylvania supplementary high school, completed in 1949.

Usual heating costs for the conventional wet-type system generally run around $1500 per unit. By using an efficient warm air system with a Dravo *Counterflo* Heater, ventilating requirement of 15 cu. ft. of fresh air per pupil per minute was met, adequate warmth was assured, and the cost was cut to $860 per unit!

This remarkable saving was possible because the Dravo *Counterflo* Warm Air Heater reduces the job to its simplest basic terms. Where most systems *end up* by warming the air, this system BEGINS with it, eliminating time-lag, and thus permitting quick heat-up in the morning, and immediate adaptation to changes in mid-day demand. Winter heating and year-round ventilating functions are efficiently combined.

The valves, traps, extensive piping, etc., of conventional wet-type systems are eliminated. Dependability and effectiveness are certified by the thousands of industrial and commercial applications where Dravo Heaters are currently serving.

This installation conforms in all respects to Pennsylvania Department of Public Instruction regulations. The architects were Scheeren & Rittenhouse, Kittanning, Pa.

The Dravo *Counterflo* Heater, with an output of 1,000,000 btu, was specified over-capacity, to take care of future expansion of the building. The heater is located in an 8-ft. x 12-ft. furnace room. Recirculated air is blended with air drawn from outside, and delivered through ducts, concealed in the hall ceiling, to the various rooms. Gas is used for fuel; ready conversion to oil is possible. Dravo Heaters are A.G.A. approved and U.L. listed.

Almost everyone concerned with school construction has budget problems today. The Dravo *Counterflo* Heater provides a proved means of substantially reducing the item of heating cost—and at the same time meeting every comfort, safety and low-maintenance requirement. A case study analysis, which describes the Elderton school in detail, will be sent on request. Write Dravo Corporation, Heating Department, Dravo Building, Pittsburgh 22, Pennsylvania. Ask for Bulletin 60-38-468.

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WELDED DESIGNS CUT STRUCTURAL COSTS 50%

By **David R. Graham**
Consulting Engineer
Tulsa, Oklahoma

STRUCTURAL designs that utilize the economies of welded frames and continuous connections enable the engineer to effect savings up to 50% in structural cost while cutting steel tonnage by 25%.

The recent construction of the livestock building for the Tulsa Fair Grounds was completed at a total cost of $112,000 or $1.12 per square foot. If this same building were to have been designed for any other than welded construction, its cost would have been $2.00 per square foot. Bolted or riveted construction would have required from 5 to 6 pounds of structural steel per square foot. The welded design required only 3½ pounds per square foot.

In an exhibition building of this kind, rigid frames, of course, provide the unrestricted vision so essential in addition to the extreme economy and simplicity of erection.

Fig. 3. New All Welded Framework *for Tulsa Fair Grounds. Has center span 60' x 200' for future show purposes.*

Fig. 4. Center Aisle *464' long shows clean, unobstructed view throughout building. Construction sets on new fill 5' deep made to correct original grade.*

Fig. 5. Horse Barn *30' span additions utilize junior beams welded to rigid frames. Built at cost of only $1.11 per square foot.*

FOR FASTER, EASIER CONSTRUCTION

Fig. 1. Livestock Building *for Tulsa Fair Grounds. Rigid frame construction covers 100,000 square feet. Erected in only 65 calendar days, in which it rained 28 days.*

FOR MORE SPACE BETTER LIGHT

Fig. 2. One of 12 bays *32' x 200' that provide tie spaces for 1,100 cattle. Roof is corrugated iron and includes 1080 plastic skylights.*

The **IMMENSITY** of the **POSSIBLE** cuts structural weight 25%

WELDED STEEL DESIGN CUTS STRUCTURAL COST 50%

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THE LINCOLN ELECTRIC COMPANY
CLEVELAND 1, OHIO

UNIT PRICES BID BY CONTRACTORS

Highway bridges and connections, St. Joseph, Mo.

The Missouri State Highway Department received four bids Feb. 2, 1951, on a project involving four separate bridges, each connected to the other by earth embankments and concrete pavement. The low bid of $1,133,815.57 was 6% below next lowest, and 14% below the highest.

Located in St. Joseph, Mo., from the Missouri River Bridge east to Tenth Street, the viaducts span streets, railroad tracks and freight yards. The first bridge is a 29′-55′-37′6″ concrete deck girder over 4th Street; second is a 41′-41′-41′ concrete deck girder; third, a 55′ I-Bm span and three continuous plate girder spans (74′-93′-74′) (95′-118′-95′) (100′-100′) over rr freight yards; and the fourth bridge is a 32′6″-60′-22′6″ concrete deck girder over 9th Street. The use of air-entrained concrete is required and the placing of concrete by pumping is permitted. Concrete shown in the unit prices requires for Class A, 1.5-1.6 bbl of cement per cu yd; Class B, 1.3-1.65 bbl. Minimum wage scale is: common labor, $0.75; semi-skilled, $0.90; and skilled, $1.35. Wage rates paid by the contractor will be about double this scale.

Bidders were:

1 Bushman Constr. Co., St. Joseph, Mo., (Contract)	$1,133,815.57
2 Clark & Runquist Constr. Co., Savannah, Mo.	1,205,387.75
4 J. E. Dunn Constr. Co., Kansas City, Mo.	1,325,270.48

Items	Quantity	Unit prices 1	2
Excav, Class A cy	214,789	$0.66	$0.80
For structure, Cl 3 cy	4,851	5.00	4.00
Compacting embankments (rolling) cy	165,220	0.05	0.05
In cuts (roll) cy	4,211	0.30	0.30
Overhaul ¼ My	471,976	0.05	0.05
Removing pavement sy	6,801.4	0.75	0.80
Curb lf	1,851	0.50	1.00
Conc sidewalk sy	683	0.50	1.00
Adjust manhole to grade ea	5	50.00	100.00
Water (compact-roll) 100 gal	30,498	0.05	0.10
Removing inlets ea	18	60.00	50.00
Manholes ea	5	60.00	50.00
7″ P.C.C. base course sy	218.9	6.00	6.00
Bituminous matl (Primer, RC-0 or 60-100 P.A.) gal	100	0.50	0.50
Asphaltic conc, typ C T	234	20.00	20.00
Gravel or crushed stone surface cy	23	5.00	5.00
P.C.C. pavement sy	15,218.7	5.82	5.82
Cl B conc (other than box culvert) cy	48.5	110.00	100.00
Fabricat struct st lb	7,290	0.40	0.30
Culvert pipe (X-Rd)			
12″ lf	636	2.50	3.00
15″ lf	170	3.50	3.50
Sewer pipe, 12″ lf	1,596	2.50	2.50
15″ lf	695	3.50	3.00
18″ lf	1,116	4.00	4.00
Reinf steel lb	5,350	0.20	0.13
Brick masonry cf	1,567	3.00	3.00
Grouted light stone revetment sy	4,502.1	7.00	7.00
Protection curb,			
Typ A conc lf	773	3.00	3.00
Typ B conc lf	334	2.00	2.00
Typ E conc lf	75	3.00	3.00
Conc median strip lf	86	5.00	5.00
Paved approach, 8″ sy	190	6.50	6.50
4″ conc sidewk sy	601.1	4.00	4.00
Guard rail lf	3,659	2.50	3.60
Barricades ea	5	200.00	200.00
Relocat barricd ea	4	100.00	75.00
Grates, bearing plate lb	7,550	0.60	0.50
Manhl frame, cov ea	11	75.00	50.00
Sodding sy	42,291	0.50	0.50
Bridge & rdwy light system ls		19,500	20,000
Total for road work		**$425,830.62**	**$455,978.95**
Bridge at Station 3+43.93			
Excav for struct, Cl 1 cy	327	3.00	12.00
Conc Cl B, handrail cy	15.7	125.00	110.00
Superstruct except handrl cy	427.4	65.00	60.00
Substruct cy	298.8	60.00	65.00
Phosphor bronze bearing plate,			
8″x17″ set	14	180.00	225.00
8″x25″ set	7	235.00	280.00
Reinfor steel lb	145,420	0.13	0.13
Conc piles in place lf	3,589	5.80	7.00
Conc pile cut-offs (at 50% of unit price for conc piles in place) lf	291	2.90	3.50
Test piles lf	190	10.00	15.00
Loading tests ea	4	2,000	1,500
Lighting conduit system ls		200.00	250.00
Total for bridge at station 3+43.93		**$103,482.20**	**$109,973.10**
Bridge at station 6+67.35			
Excav for struct, Cl 1 cy	491	3.00	12.00
Conc Cl B, handrail cy	16	125.00	110.00
Superstruct except handrl cy	414.7	65.00	60.00
Substructure cy	391.5	60.00	65.00
Phosphor bronze bearing plate			
8″x17″ set	13	180.00	225.00
8″x21″ set	8	205.00	250.00
Reinf steel lb	156,560	0.13	0.13
Conc pile in pl lf	4,218	5.80	7.00
Conc pile cut-offs (at 50% of unit price for conc piles in pl) lf	342	2.90	3.50
Test piles lf	100	10.00	15.00
Lighting conduit system ls		200.00	250.00
Total for bridge at station 6+67.35		**$104,907.50**	**$115,732.30**
Bridge at station 10+41.10			
Excav for struct, Cl 1 cy	983	3.00	15.00
Conc Cl B, handrail cy	91.3	125.00	110.00
Superstruct except handrl cy	772.6	60.00	60.00
Substructure cy	809.7	60.00	65.00
Fabricat struct steel (plate girder spans) lb	905,590	0.175	0.17
Fab struct steel (I-Bm spans) lb	66,940	0.165	0.16
Castings, steel lb	24,550	0.75	0.80
Gray iron alloy lb	1,040	0.90	1.00
Wrought iron drain troughs lb	34,480	0.55	0.45
Pipes, 6″ lf	92	18.00	12.00
8″ lf	56	20.00	15.00
Reinf steel lb	242,480	0.13	0.13
Conc pile in pl lf	8,510	5.80	7.00
Conc pile cut-offs (at 50% of unit price for conc pile in pl) lf	690	2.90	3.50
Test piles lf	150	10.00	15.00
Loading tests ea	1	2,000	1,500
Lighting conduit system ls		1,750	2,000
Total for bridge at station 10+41.10		**$408,042.75**	**$425,832.60**
Bridge at station 20+74.68			
Excav for struct, Cl 1 cy	191	3.00	12.00
Conc Cl B, handrail cy	14.6	125.00	110.00
Superstruct except handrl cy	252.2	65.00	60.00
Substruct cy	175.7	60.00	65.00
Phosphor bronze bearing plate,			
8″x17″ set	8	180.00	225.00
8″x25″ set	4	235.00	280.00
Reinf steel lb	89,560	0.13	0.13
Conc pile in pl lf	1,998	5.80	7.00
Conc pile cut-offs (at 50% of unit price for conc pile in pl) lf	162	2.90	3.50
Test piles lf	100	10.00	15.00
Loading tests ea	1	2,000	1,500
Light conduit system ls		200.00	200.00
Total for bridge at station 20+74.68		**$58,614.00**	**$62,766.30**
Concrete sewer at station 1+50			
Excav for struct, Cl 3 cy	1,810	7.00	8.00
Conc, Cl B cy	246.1	65.00	65.00
Reinf steel lb	35,600	0.12	0.13
Total for concrete sewr at stat 1+50		**$32,938.50**	**$35,104.50**

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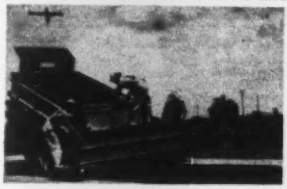

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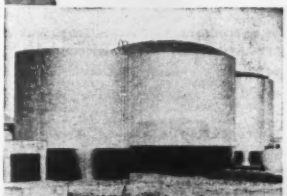

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CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ELSIE EAVES, Manager *J. A. MAHONEY, Reports* *M. R. ROESSLER, Statistics*

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION

† **Mass., Chelsea**—SPRINKLER SYS.—B.A. 5/9—Pub. Wks. Office, Bldg. 64, sprinkler sys., Naval Hospital, Spec. 25643. Plans deposit $10.

BIDS ASKED—BUILDINGS

▲**R. I., Providence**—HOUSING—B.A. 5/23—Providence Housing Auth., 263 Chadat Brown St., 632 family low-income housing project of Hartford Park. Approx. $6,000,000. Creer, Kent, Mather, Cruise & Aidrich, 423 Industrial Trust Bldg., archts. CD 5/5/50.

SOON LETS CONTRACT—BUILDINGS

Mass., Middleboro—FACTORY—Leonard & Barrows Shoe Co., 191 Center St., soon lets contract, 3 story, bsmnt., 85x95 ft., masonry shoe factory adn., $200,000. Mark Linenthal, 16 Lincoln St., Boston, engr.

LOW BIDDERS—BUILDINGS

▲ **O. D. Purington Co., Inc.,** 171 Westminster St., Providence, R. I. Low Bidder, **$1,228,000.** Memorial High SCHOOL ADAMS, MASS. Town, School Dpt., Commercial St., Adams, Mass. Bids Apr. 12. CD 3/27.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

† **Md., White Oak**—SIGNAL ALARM SYS.—B. A. 5/2—Pub. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash., D. C., furnishing, installing coded signal alarm sys. for Naval Ordnance Laboratory, Noy 27008, Spec. 29010. CD 7/26/48 under public bldgs.

† **Maryland**—B. A. 5/18—Bureau Pub. Rds., Dpt. Commerce, 1440 Columbia Pike, Arlington, Va.

Prince Georges Co.—rein.-con. structures over East-West Hy. and approaches 0.152 mi., Baltimore-Washington Parkway, Proj. 161, Plans deposit $10. H. J. Speiman, 1440 Columbia Pike, Arlington, Va., div. engr

BIDS ASKED—BUILDINGS

Pa., Camp Hill—HIGH SCHOOL—B. A. 5/8—Camp Hill School Bd., Boro Hall, construct high school addn. $500,000. Plans deposit $35. Shotwell & Eden, 23 S. Front St., Harrisburg, archts. Extended date. CD 4/18.

Pa., Butler—HOSPITAL—B. A. 5/15—Butler County Memorial Hospital, Butler, hospital addn. Plans deposit $100. Samuel Hannaford & Sons, 1024 Dixie Terminal Bldg., Cincinnati 2, O., archts. CD 11/29/48.

▲ **Pa., Pittsburgh**—HOUSING—B. A. 5/22—Pittsburgh Housing Auth., City County Bldg., 2 and 3 story 460 family units, brick and block constr. Housing development, Bedford Dwellings, Bedford Ave., $5,000,000. Marks, Fisher & Simboli, 605 Hardy Hays Bldg., archts. CD 8/4/50.

LOW BIDDERS—HEAVY CONSTRUCTION

▲ **Latrobe Road Const. Inc.,** P. O. Box 150, Latrobe, Pa. Low Bidder, **$1,271,773.** 17,300 ft. highway constr., incl. 2 continuous concrete deck plate girder bridges, TR 680 and 982, Indiana and Westmoreland Counties, PENNSYLVANIA, State Hy. Dpt., 506 N. Office Bldg., Harrisburg, Pa. Bids Apr. 20. CD 3/22.

▲ **John H. Swanger, Inc.,** Lancaster, Pa. Low Bidder, **$1,005,271.** 17,798 ft. const. of divided highway incl. a plate girder and an I-beam bridge, a section of Allentown by-pass, Route U.S. 22, Lehigh Co., PENNSYLVANIA, State Hy. and Bridge Auth., 506 N. Office Bldg., Harrisburg, Pa. Bids Apr. 20. CD 3/20.

CONTRACTS—BUILDINGS

▲ **Briarwood Towers,** c/o Joseph Schafran, archt., 200 W. 72 St., New York 23, N. Y. Owner builds, **$4,000,000.** Garden APARTMENT project for 514 families at 85 Rd., 85 Dr. and 143 St., BRIARWOOD, N. Y.

▲ **B. L. Building Corp.,** 3036 Avenue U, Brooklyn 29, N. Y. Separate contracts, **$384,000,** 6 story 48 APARTMENT units; **$528,000,** 6 story 67 apartment units; **$384,000,** 6 story 48 apartment units, 2212 Plimb First St. BROOKLYN, N. Y. CD 3/1.

▲ **Charles Operating Corp.,** c/o Kavy & Kavovitt, archts., 44 Court St., Brooklyn 2, N. Y., Separate contracts. Approx. **$1,320,600.** 3 story garden APARTMENTS, Franklin and Blossom Aves., West of Main St., FLUSHING, N. Y. CD 12/7.

▲ **Esther Ellman,** c/o Joseph Schafran, archt., 200 W. 72 St., New York 23, N. Y., Separate contracts. **$5,390,000.** 22 three story APARTMENTS and garages in area bounded by Francis Lewis Blvd., Grand Central Parkway, 209 St., and Whitehall Terrace, HOLLIS, N. Y. CD 11/10.

▲ **Rockwood Park Homes,** c/o Alwyn Cassens, Jr., archt., 116-55 Queens Blvd., Forest Hills, N. Y. Owner builds. **$1,950,000.** 150 one family HOMES on site bounded by Cross Bay Blvd., Belt Parkway and 159 Ave., HOWARD BEACH, N. Y.

▲ **200 East End Ave. Corp.,** 28 Cow Lane, Great Neck, N. Y. Separate contracts. **$2,112,000,** 16 story APARTMENT, East End Ave. from 89 to 90 Sts., NEW YORK, N. Y. CD 1/11.

Starrett Bros. & Eken, Inc., 63 Wall St., New York 5, N. Y. Contract Awarded. **$800,000.** parking GARAGE on west side of Sedgwick Ave., north of Landing Rd. NEW YORK, N. Y. Equitable Life Assurance Society, 393 Seventh Ave., New York 1, N. Y. CD 1/11.

▲ **Merritt Park Builders,** c/o Rudolph L. Novak, archt., 713 Main St., Clifton, N. J. Owner builds. **$1,750,000.** 155 one family HOUSES on East Passaic Ave. BLOOMFIELD, N. J.

▲ **Wigton-Abbott Corp.,** 1225 South Ave., Plainfield, N. J. Contract Awarded. Approx. **$1,500,000.** mfg. PLANT for steel drums on 30 acre site on St. Hy. Route 25, LINDEN, N. J. Rheem Mfg. Co., 570 Lexington Ave., New York 22, N. Y. CD 3/5.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

† **South Carolina**—B. A. 5/8—U. S. Eng., Custom House, Charleston, maintenance dredging in Charleston Harbor, 35-ft. project, (Shoals Nos. 5, 5A, 6 and 6A). Serial No. CIVENG 38-081-51-6. CD 4/13.

† **Ga., Macon**—B. A. 5/15—Dpt. Navy, Officer in Charge of construction, P.O. Box 365, Naval Base, Charleston, S. C., water distr. sys. extens., approx. 7,000 ft. 6 and 8 in. c.i. water pipe valves, hydrants, altitude valves for elevated tanks at Naval Ordnance Plant. NOY 26669. Spec. 28710. Plans deposit $10.

▲ **La., New Orleans**—B. A. 6/1—New Orleans R. R. Terminal Bd., City Hall Annex, Proposal 17,501, overpass at South Broad Ave. over New Orleans Union Passenger Terminal, $3,700,000. Plans deposit $100, G. A. Heft & Co., 820 Union St., archts. CD 2/4/49.

LOW BIDDERS—HEAVY CONSTRUCTION

▲† **T. L. James & Co., Ruston, La.** Low Bidder, **$1,477,377.** rip-rap, derrick stone for gated portion of Morganza Control Structure, Inv. 51-157, Pointe Coupee Parish, LOUISIANA. U. S. Eng., Foot of Prytania St., New Orleans, 9, La. Bids Apr. 17. CD 3/7.

LOW BIDDERS—BUILDINGS

▲ **John W. Daniel & Co.,** Danville, Va., Low Bidder, **$1,257,000.** construct Central HIGH SCHOOL, CHARLOTTESVILLE, VA. Albemarle Co., Charlottesville, Va. Bids April 16. CD 4/9.

CONTRACTS—BUILDINGS

▲ **Irons & Reynolds, Inc.,** 1724 H. St., N. W. Wash., D. C., Contract Awarded, **$1,298,777,** for constructing new white HIGH SCHOOL and high school for Negroes, FREDERICKSBURG, VA. City School Bd., Fredericksburg, Va. CD 4/9 under LB.

▲ **Stone & Webster Engr. Corp.,** 49 Federal St., Boston, Mass. Contract Awarded. Approx. **$1,700,000.** steam electric PLANT on old John L. Roper site, NORFOLK, VA. Virginia Electric & Power Co., 7 and Franklin Sts., Richmond, Va. CD 2/9.

▲ **Wade H. Herrin,** Lakeland, Fla. Owner Builds. **$1,600,000.** 400 APARTMENT units, BARTOW, FLA.

MIDDLE WEST

CONTRACTS BUILDINGS

▲ **Neighborgall Constr. Co.,** Huntington, W. Va. Contract Awarded. **$1,000,000.** Steel MILL, PORTSMOUTH, O. Detroit Steel Co., 1025 Oakwood St., Detroit, Mich. Awarded Apr. 17. CD 2/12.

▲† **Montgomery Constr. Co.,** 303 W. Main St., Grove City, Pa. Contract Awarded. **$1,895,000.** 3 WAREHOUSES, Niles Rd., Wardwell Yards, WARREN, O. General Services Admin., Pub. Bldgs. Admin., General Services Bldg., 19 and F Sts., N. W., Wash., 25, D. C. Bids Mar. 27. CD 4/9, under LB.

▲ **Charlson Co.,** Lycast St., Wyandotte, Mich. Contract Awarded. **$2,500,000.** PLANT addns., alterations incl. office and laboratory, WYANDOTTE, MICH. Wyandotte Chemicals Corp., Wyandotte, Mich. Leinweber, Yamaski & Hellmuth, 1901 Industrial Bank Bldg., Detroit, Mich., archts.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

† **Minn., Duluth**—AIRPORT IMPRVS.—B.A. on or about 5/15—U. S. Eng., 1709 Jackson St., Omaha 2, Neb., runway exten. at Duluth Air Force Base, Eng. 25-066-51-33 (SP). Plans deposit $50.

† **Missouri**—B.A. 5/15—U. S. Eng., P. O. Box 97, Memphis 1, Tenn., 30,000 cu. yd. earthwork and incidental work, Levee Item—L-198R SFR, Hargrove, levee stations, 30 plus 32, 38 plus 51, along left bank of St. Francis River in Levee dist. 4, Dunklin Co., St. Francis Basin Proj. CIVENG 40-041-51-124.

BIDS ASKED—BUILDINGS

▲ **Tex., Port Arthur**—DWELLINGS—B. A. 5/15—Port Arthur Housing Auth., Port Arthur, 18 two story bldgs. for total 148 DWELLING units, brick veneer, concrete slab fdn. constr. Tex. 34-1. $1,100,000. Plans deposit $50. Golemon & Rolfe, 915 Woodrow St., Houston, archts., W. P. Moore, 4605 Montrose Blvd., Howard & Johnson, Scanlan Bldg., both of Houston, engrs. CD 1/31.

LOW BIDDERS—HEAVY CONSTRUCTION

▲ **J. B. Clardy Constr. Co.,** Box 7024, Sylvania Station, Fort Worth, Tex., Low Bidder, **$1,125,936.** est. $2,000,000. steel, concrete Forest Ave. vehicle and pedestrian bridge, DALLAS, Tex. Dallas County, Court House, Dallas, Tex., Bids April 16. CD 4/4.

CONTRACTS—HEAVY CONSTRUCTION

▲ **E. W. Coons, Inc.,** Hibbing, Minn. Contract Awarded. **$722,187.** paving, shoulder grading 12.7 mi. between Milaca and Ogilvie, Kanabec and Mille Lacs Counties; **McLean-Astleford Co.,** 400 W. 78 St., Minneapolis, Minn. **$995,081.** grading, grav. base, road-mixed, plant mixed bit. surf. and bridges 13.1 mi. between 59 Ave. East in Duluth and Knife River underpass, Lake and St. Louis Counties, MINNESOTA. State Hy. Dpt., 1246 University Ave., St. Paul, Minn. CD 4/18, under LB.

▲† **Peter Kiewit Sons Co.,** 1024 Omaha National Bank Bldg., Omaha, Neb. Contract Awarded. **$1,294,707,** est. $1,157,160. constr., Willow Creek Dam, Colorado Big Thompson Proj. Spec. DC 3343, COLORADO. Bureau Reclamation, Dpt. Interior, Bldg. 1A, Denver Federal Center, Denver, Colo. Awarded Apr. 16. CD 4/19, under LB.

CONTRACTS—BUILDINGS

G. J. Grant Constr. Co., Como Ave. and Northern Pacific tracks, St. Paul, Minn. Contract Awarded. **$897,900.** HOSPITAL addn., ST. PAUL, MINN. St. John's Hospital, H. C. Manke, pres. Bd. Directors, 390 Mound Blvd., St. Paul, Minn. Bids Mar. 6. CD 2/23.

▲ **Westinghouse Electric Corp.,** 101 W 11 St. Kansas City, Mo. Contract Awarded. **$1,105,000.** TURBO-GENERATOR for light and power plant, KANSAS CITY, KAN. Bd. Pub. Utilities, Kansas City, Kan. CD 3/28, under LB.

▲ **Blosser Building Co.,** Crawford Bldg., Topeka, Kan. Owner builds. **$2,000,000.** co-operative type HOUSING Proj., TOPEKA, KAN.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

† **Calif., Fort Ord**—LOADING PLATFORM—B.A. 5/11—Purch. and Contg. Office, Dpt. Army, Fort Ord, loading platform and ramps at balloon spur.

† **Calif., Lathrop**—B.A. 5/14—U. S. Eng., Wright Bldg., Sacramento, rehabilitate water system, dismantle elevated tank, cement lined reservoir, etc., ENG 51-4.

Washington—B.A. 5/15—Clallam Co. Pub. Utility Dist., Port Angeles, 1250-hp. propeller-type turbine, 1125 kva generator, 1 governor, 2 voltage regulators, etc. for Hoh River Dobow hydroelectric proj. Forks. Plans deposit $20. Extended date. CD 4/13.

† **Arizona**—CIRCUIT BREAKERS—B.A. 5/16—Bureau Reclamation, Dpt. Interior, Phoenix, four 69,000 volt circuit breakers, ten 69,000 volt dis-connecting switches for Davis 69 kv switchyard, Davis Dam Proj. Spec. 3005-22, L. N. McClellan, Bldg. 1A, Denver Federal Center, Denver, ch. engr.

BIDS ASKED—BUILDINGS

Calif., Los Angeles—NURSES HOME—B.A. 5/15—Bd. Supervs., Los Angeles Co., 501 Hall of Records, nurses home at General Hospital, $500,000. Williams & Wilson, 3757 Wilshire Blvd., Los Angeles, archts. CD 11/15/49.

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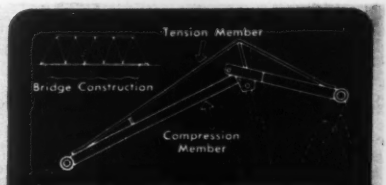

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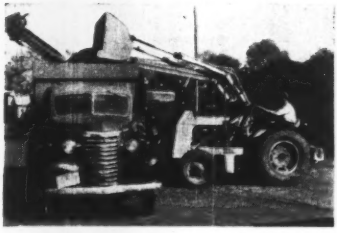

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▲Calif., Los Angeles—HOSPITAL UNIT—B.A. 5/29—Bd Supervs., Los Angeles, 501 Hall of Records, Los Angeles, 8 story, rein.-con. communicable diseases unit of the General Hospital, $3,500,000. Plans deposit $100. Williams & Wilson, 3757 Wilshire Blvd., Los Angeles, archts. CD 11/15/49.

CONTRACTS—HEAVY CONSTRUCTION

▲† Willamette Iron & Steel Co., 2860 N.W. Front St., Portland, Ore. Low Bidder, $4,570,460, intake gates and appurtenances for McNary Dam power house, Inv. No. CIVENG 45-164-52-43, OREGON. U. S. Eng., 19 E. Poplar St., Walla Walla, Wash. Bids April 17. CD 3/6.

▲ United Concrete Pipe Corp., Box 425, Baldwin Park, Calif., Contract Awarded. $1,671,178. earthwork, pipe lines, structures for laterals 124.5E, 127.7E, and 130.4E and sublaterals, incl. reservoirs, pumping plant, Unit 3, Central Valley Proj. Spec. DC 3327, CALIFORNIA. Bureau Reclamation, Dpt. Interior, Bldg. 1A, Denver Federal Center, Denver, Colo. Awarded. Apr. 16, CD 4/3 under L. B.

Frederickson & Watson Constr. Co., 873 81 Ave., Oakland, Calif., Contract Awarded, $513,337, c.conc. 5.2 mi. between Chualar and Spencer Underpass, Monterey Co. CALIFORNIA State Div. Hys., P. Wks. Bldg., Sacramento, Calif. Bids Mar. 28, awarded Apr. 16. CD 4/12, under LB.

CONTRACTS—BUILDINGS

▲ Bein Constr. Co., 139 S. Beverly Dr., Beverly Hills, Calif., Contract Awarded, $1,359,900, elementary and intermediate SCHOOL, RIVERA, CALIF. Rivera School Dist., 8910 E. Slauson St., Rivera, Calif. Bids Apr. 3, awarded Apr. 18. CD 4/9, under LB.

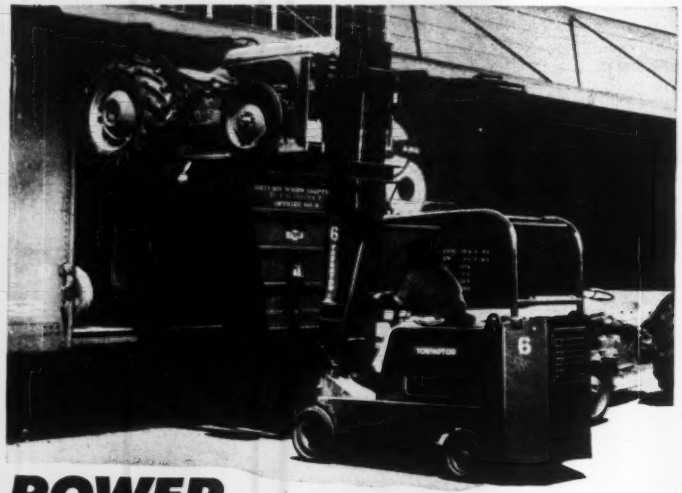
ALASKA

BIDS ASKED—HEAVY CONSTRUCTION

J. J. Badraun, 109 N. 122 St., Seattle 33, Wash., Low Bidder, $458,359, 5-span steel deck-girder bridge 398 ft. long over Chena River and three 44 ft. I-beam spans over Noyes Slough, ALASKA. Alaska Road Comm., Juneau, Alaska. Bids April 16. CD 3/2.

LOW BIDDERS—BUILDINGS

▲ † Patti MacDonald Constr. Co., 1340 Admiral St., Kansas City, Mo. Low Bidder, $2,709,400. est. $3,818,888. 23 8-family QUARTERS, Inv. No. S95-507-51-89. FORT RICHARDSON, ALASKA. U. S. Eng., New Washington Hotel, Seattle 1, Wash. Bids April 17. CD 3/29.



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PROPOSED PROJECTS

WATER SUPPLY

Calif., Belmont—Belmont County Water dist., Belmont, voted bonds, water sys. addns. $350,000.

Calif., Yuba City—City, City Hall, voted bonds, constr., new well and replacement of watermains. $100,000. CD 2/16.

N. C., Knightdale—Town, E. P. Harper, mayor, Knightdale, water sys. Joseph N. Farlow, 111 Raleigh Bldg., Raleigh, consult. engr.

Ore., North Bend—City, City Hall, voted bonds, water sys. imprvs., extens. $282,500. Bob Kyle, City engr.

Tex., Eagle Ford—Town, Odey M. Cowart, mayor, via Dallas, defeated bonds, WW, storage, lines, pumping, $650,000; artesian wells, $75,000.

SEWERS, WASTE DISPOSAL

Calif., Los Angeles—Bd. Supervs. Los Angeles Co., 501 Hall of Records, sanitary sewers in Danby Ave., Los Nietos, $77,800; sanitary sewers in Primrose Ave., C.I. 1318, Temple City, $99,900. C. E. Arnold, co. engr.

Calif., Pacific Grove—City, City Hall, voted $650,000 bonds, sewage disposal plant. Harry N. Jenks, 63 Crescent Dr., Palo Alto, consult. engr. CD 3/12/45.

▲ Ill., Chicago—City, City Hall, Zone 2, Ainslee Sewer System, Contrs. 2 and 3, $3,844,000.

▲ Ill., Hamilton—City, City Hall, sewage treatment plant works. $3,000,000. Consoer, Townsend & Assocs., 351 E. Ohio St., Chicago, 11, Ill., consult. engrs.

▲ Tex., Houston—City, Oscar Holcombe, mayor, City Hall, 900 Brazos St., bond election May 29, sanitary sewers, east of Helmers, north of Liberty Rd. $3,500,000; sanitary sewers, in area south Buffalo Bayou, east of G. C. and S. F. Ry. $500,000; sanitary sewers, in area west of Shepherd Dr. and north Buffalo Dr. $1,000,000; sanitary sewers, between Helmers and Shepherd Dr., from Link Rd. north to city limits, $1,000,000; sanitary sewer lines in areas where needed throughout the city, $2,700,000; storm sewers, from G. H. & S. A. Ry. north to Buffalo Bayou and Bray Bayou west to Greenwood, $200,000; storm sewers bounded 8 and 12 Sts. between Studewood and Ashland, $400,000; storm sewers, between Kirby Dr. and H. & T. C. Ry. from S. A. & A. P. Ry. north to Buffalo Bayou, $1,700,000; storm sewers, between Abernathy and Solo Sts. from Clinton Dr. to Liberty Rd. $800,000; storm sewers from Sayers east to Lockwood Dr. from Liberty Rd. north to Hunting Bayou, $900,000; storm sewers, Fulton St. east to H. E. & W. T. Ry. from Burlington-Rock Island tracks north to Berry Rd. and to Laura Koppe Rd. $1,850,000; storm sewers, from Hayes St. north to Burlington-Rock Island Ry. and from Little White Oak Bayou east to Irvington Blvd. $700,000; storm sewers, from Buffalo Dr. to Welch St. from Taft to Heiner-Bagby Sts. $250,000; storm sewers from Ella Blvd. to Shepherd Dr. from Rosslyn Rd. to Suebarnett, $500,000; storm sewers from Scott to Baltimore Sts. from G. H. & S. A. Ry. to OST., $700,000; storm sewers in areas where needed throughout the city, $2,000,000. CD 5/24/49.

BRIDGES

Tex., Austin—City, new Colorado River Bridge to link Guadalupe and Lavac Sts. with South 1 St. $550,000. Julian Montgomery, 604 West Ave., consult. engr. CD 11/15.

▲ Tex., Houston—City, Oscar Holcombe, mayor, City Hall, 900 Brazos St., bond election May 29, bridges and grade separations. $1,500,000. L. Fugate, city engr. CD 6/8.

STREETS AND ROADS

Ia., West Des Moines—City, paving. $110,000. John Burris, West Des Moines, city engr.

Mich., Ann Arbor—City, Mayor Wm. E. Brown Jr., bond election May 29, resurf. 14 streets, wid'n. resurf. 6 streets, extensive curb replacements. $495,000. CD 11/21/44.

O., Lisbon—Comrs. Columbiana Co., Court House, surf. treat more than 100 mi. roads Charles O. Snyder, co. engr.

† Tennessee—Bureau Pub. Roads, Dpt. Commerce, 1440 Columbia Pike, Arlington, highway between Gatlinburg and Banner Ridge in Great Smokies National Park. $470,000.

Tennessee—State Hy. Dpt., Memorial Bldg., Nashville, Greene Co.—wid'n. Hy. 11-E, at Greeneville. $100,000.

Tennessee—State Hy. Dpt., Memorial Bldg., Nashville, Hamilton Co.—imprv. Dodson Ave. in Chattanooga between 3 and Glass Sts. $250,000.

Tex., Houston—City, Oscar Holcombe, mayor, City Hall, 900 Brazos St., bond election May 29, gravelling secondary streets. $500,000. CD 5/24/49.

▲ Tex., Houston—City, Oscar Holcombe, mayor, City Hall, 900 Brazos St., bond election May 29, major street and highway construction, $3,000,000; asph. and concrete type street paving for newly-annexed areas $1,000,000. L. Fugate, city engr. CD 5/24/49.

Tex., Wichita Falls—City, East-West Thoroughfare through city. $400,000. CD 12/14/49.

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AIRPORTS

▲† **Tex., Big Spring**—RUNWAYS, TAXIWAYS, etc.—U. S. Eng., 1127 Texas and Pacific Bldg., Fort Worth, runways, taxiways, $6,000,000; lighting sys. $200,000; misc. constr. of buildings, $4,125,000; WW, $175,000; academic and hangar, $2,500,000; roads and streets, $400,000; storm sewer and drainage $350,000; sanitary sewers, $250,000. Freese & Nichol 407 Danciger Bldg., Fort Worth, Brasher, Butler, French, James Mulvaney & Puckett, Big Spring, Castle Sr. and Jr. Olds Yeatts, Allen Kanto, Tucker, Lindberg & Collier, Abilene, engrs-archts. CD 2/2.

† **Tex., Big Spring**—ARMY BLDGS—U. S. Eng., 1127 Texas and Pacific Bldg., Fort Worth, plans by Brasher, Butler, French, James, Mulvaney & Puckett, Big Spring, Initial rehabilitation portion army bldgs. at Wichita Falls Air Force Base. $500,000. CD 12/28.

▲ **Tex., Houston** — AIRPORT IMPRVS. — City, Oscar Holcombe, mayor, City Hall, 900 Brazos St., bond election May 29, airport imprvs. $1,000,000. L. Fugate, city engr. CD 1/26.

▲† **Tex., Kelly Air Force Base**—BARRACKS, etc.—U. S. Eng., 606 Santa Fe Bldg., Galveston, plans by Bartlett Cocke, 3501 Broadway, San Antonio, 20 wood framing type barracks, $600,000; 2 mess halls, $650,000; W. E. Simpson Co., 945 Milam Bldg., Halsey & Royer 2107 Transit Tower, both San Antonio, consult. engrs., CD 1/5; plans by Phelps & DeWees & Simmons, Majestic Bldg., San Antonio, fence enclosure, for warehouse and bldg. area, $75,350; supply warehouse, $178,000; incinerator, $60,000, Matthews & Kennan, Transit tower; B. Baker, Majestic Bldg.; F. T. Drought, 117 W. Pecan St., J. W. Beretta Engineers, Inc., Travis Bldg., all San Antonio, consult. engrs., CD 5/4/50; c.i. water lines, facilities, $40,000; outside sanitary sewers lines, $60,000; storm and drainage lines, $60,000 in area of proposed huge administration headquarters bldg. and 20 barracks area, Frank T. Drought, 117 W. Pecan St., San Antonio, consult. engr.; plans by Phelps & DeWees & Simmons, Majestic Bldg., San Antonio, headquarters administration bldg. for U. S. Air Force Security Service, 2 and 3 story, 313,000 sq. ft., 9.7 acres suspended floors and roof; 470x5,000 ft. mono. rein.-con. structure; drilled pile fdn., acoustically-treated area, summer-winter air-conditioning, etc. $3,130,000, Matthews & Kennan, Transit Tower, B. Baker, Majestic Bldg., J. W. Beretta Engineers, Inc., Travis Bldg., F. T. Drought, 117 W. Pecan St. all San Antonio, consult. engrs.

† **Wash., Spokane**—THEATER—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, theater at Fairchild Air Force Base. $400,000.

▲ **Man., Portage La Prairie**—RUNWAYS—Dpt. Transport Hunter Bldg., Ottawa, Ont., runways for Royal Canadian Air Force Base, $4,500,000. K. F. Hurst, Defence Constr. Ltd., Kensington Bldg., Winnipeg, Man., regional engr.

PUBLIC BUILDINGS

▲ **Calif., Compton**—SCHOOLS—Compton Union High School Dist., 601 S. Acacia St., plans by Austin, Field & Fry, 2311 W. 3 St, Los Angeles, 56,250 sq. ft. Walton Junior High School, $790,803; new Junior High School, $3,297,300. CD 11/1/50.

▲ **Ill., East St. Louis**—SCHOOLS—Bd. Educ., School Dist. 189, St. Clair Co., Bernice Goedde, pres., 240 N. 6 St., defeated $1,200,000 bonds, addns., to schools and junior high school, high school at 51 and State Sts., completing Lincoln High School, etc. CD 2/27.

▲ **Kan., Wichita**—SCHOOL—Bd. Educ., Wichita, plans by Thomas & Harris, 321 W. 2 St., West High School. $3,250,000. CD 6/16/50.

▲† **Ky., Lexington**—SHOP—U. S. Eng., 830 W. Broadway, Louisville, plans by J. Stephen Watkins, 145 E. High St., 1 story, concrete block, 105,000 sq. ft. maintenance shop, Lexington Signal Depot, $1,000,000. CD 1/9.

▲ **Ky., Louisville**—SCIENCE—University of Louisville, 2301 S. 3 St., plans by W. S. Arrasmith, Lincoln Bldg., 4 story natural science bldg. $1,000,000. CD 3/19.

▲ **Ky., Paris**—FACTORY—City, plans by John T. Gillig, 180 Walnut St., Lexington, farm emplement factory, near here, $1,000,000.

▲ **Ky., Prestonburg**—HOSPITAL—Floyd Co. Fiscal Court, plans by Otis & Grimes, Tyler Bldg., Louisville, hospital, $1,100,000.

Ky., Russellville—SCHOOL—Bd. Educ., plans by Walter Scott Roberts, 115 E. 4 St., Owensboro, brick, concrete block school, remodel gymnasium, $300,000.

▲ **La., New Orleans**—GRAIN ELEVATOR—City, Port Bd., grain elevator, doubling existing capacity, for handling and storing grain, $5,000,000.

▲ **Mass., Stoneham**—SCHOOL—Town, Supt. Schools, plans by Edmund I. Leeds & Assoc., Inc., 155 Brighton Ave., Allston, 3 story, brick, concrete high school, incl. gymnasium, assembly hall and shops. $1,500,000. CD 4/3.

▲ **Mich., Detroit**—HOUSING—City of Detroit Housing Auth., H. J. Durbin, dir., City Hall, plans by Smith-Hinchman & Grylls, 800 Marquette Bldg., 350 family units, Edward Jeffries Housing, Area 2, $3,500,000; plans by Harley, Ellington & Day, Inc., 153 E. Elizabeth St., 290 family brick units, Frederick Douglas Homes, $3,250,000. CD 1/10/45.

▲ **Miss., Natchez** — SCHOOL — City, $2,000,000 bond election May 1, school imprvs.

▲ **Mo., Columbia**—HOSPITAL—Curators University of Missouri, Leslie Cowan, secy., Jesse Hall, plans by Jamieson & Spearl, Arcade Bldg., 812 Olive St., St. Louis, Zone 1, medical school addns., imprvs., $3,625,000, residence bldg. for teaching hospital personnel, $675,000; enlarging teaching hospital, $6,000,000. CD 1/26/49.

▲ **Neb., Omaha**—GENERATING PLANT—Omaha Public Power Dist., 17 and Harney Sts., steam generating plant. Approx. $1,000,000. Sargent & Lundy, 140 S. Dearborn St., Chicago, Ill., consult. engrs.

▲† **Nev., Hawthorne**—ASSEMBLY PLANT—Dpt. Navy, 12th Naval Dist., Federal Office Bldg., San Francisco, Calif., plans by Blanchard, Maher & Lockard, 232 W. First St., Reno, mine assembly plant, near here. $2,000,000.

▲ **N. Y., Geneva**—HIGH SCHOOL—Bd. Educ., Geneva, Senior High School $1,944,000.

N. Y., New York—MUSEUM—American Museum of Natural History, Central Park West and 79 St., plans by Embury & Lucas, 150 E. 61 St., Zone 21, 5 story museum, W. 177 St. between Columbus Ave. and Central Park West. $500,000.

▲ **N. C., Marion**—SCHOOLS—McDowell Co. Bd. Educ., N. F. Steagle, supt., Marion, bond election May 29, schools. $1,000,000.

▲ **N. D., Grand Forks**—EDUCATION, etc.—State Bd. Higher Educ., State Capitol, Bismarck, plans by Wells & Denbrook, 425 Kittson Ave., education bldg. $600,000; plans by Pfeifer & Shultz, 702 Wesley Temple Bldg., Minneapolis, Minn., power plant imprvs., $400,000, both at University of North Dakota. CD 11/16/50.

▲ **O., Marion**—HIGH SCHOOL, etc.—Bd. Educ. Marion, $2,825,000 bond election May 8, New Marion High School and imprv. existing bldgs., $3,000,000. CD 3/7/46.

▲ **O., Newark**—SCHOOL—Bd. Educ., bond election May 8, 8-room school to replace Moholm School; 8-room addns. to Cherry Valley; 6-room addn. to Wilson; recreation and assembly addns. to Woodside and Mound Schools; 4-room addn. to Keller; new South Side Junior High School; recreation and assembly addn. to Hazelwood; 8-room school in Cedar Hill area. $2,650,000.

Ore., Redmond — HOSPITAL — Central Oregon Hospital Assn., Redmond, $435,000, bond issue Apr. 30, hospital. CD 8/8/49.

▲ **Pa., Aliquippa**—HOUSING—Beaver Co. Housing Auth., Beaver, plans by Ackley, Bradley & Day, Sewickley, 2 story, 25x112 ft. 100 family federal housing, row houses. $1,250,000.

Pa., Courtney—SCHOOL—School Dist. Union Twp., Courtney, Pa., plans by Beall & Perkins, Union Trust Bldg., Washington, 1 story bsmnt., 80x300 ft. brick, tile, school, Union Twp., near here. $335,000.

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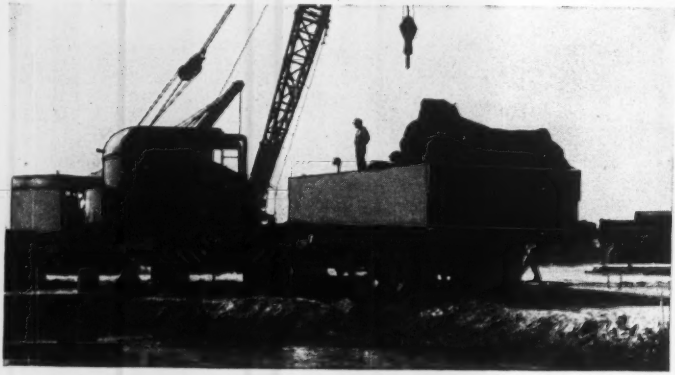

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▲ **Tex., Houston**—HEALTH and WELFARE, etc.—City, Oscar Holcombe, mayor, City Hall, 900 Brazos St., bond election May 29, public health and welfare bldg. $500,000; civic center, $1,000,000. L. Fugate, city engr. CD 9/16/49 and 7/21/49 respectively.

▲ **Wash., Ephrata**—SCHOOL—School Bd., Ephrata voted bonds, high school. $1,000,000. J. M. Taylor, Jr., Arcade Bldg., Seattle, Zone 1, archt. CD 2/2.

▲ **Wash., Grandview**—SCHOOL—School Bd., Grandview, plans by J. Villesvik, Larson Bldg., Yakima, Junior-Senior High School, $1,000,000. CD 4/13.

COMMERCIAL BUILDINGS

▲ **Ga., Augusta**—APARTMENT UNITS—Mansion Homes, c/o Vinston & Co., 80 Lincen Ave. N.E., Atlanta, 210 apartment units, $1,500,000.

▲ **Ia., Marshalltown**—DORMITORY—Marshalltown Soldier's Home, Marshalltown, dormitory, $1,000,000.

▲ **Mo., St. Louis**—APARTMENTS—Urban Development Corp. of St. Louis, Russell E. Gardner, Jr., pres., c/o Reinholdst & Gardiner, 400 Locust St., Zone 2, plans by George F. Hellmuth, International Office Bldg. and Harris Armstrong, 3 Sappington Spur, Kirkwood, Zone 22, three 26 story, bsmnt., apartments, Olive to Chestnut Sts., 15 to 18 Sts.

Neb., York—ADMINISTRATION—York College, York, plans by Meginnis & Schaumberg, 614 Federal Security Bldg., Lincoln, administration bldg. $300,000. CD 1/16.

N. Y., Brooklyn—APARTMENT—89 Hicks St. Corp., 12 E. 41 St., New York Zone 17, plans by George G. Miller, 67 W. 44 St., New York, Zone 18, 9 story apartment for 63 families, 130 Hicks St. $400,000.

N. Y., Flushing—HOUSES—Lana Gardens, c/o J. Herbert Burmeister, archt., 92-21 165 St., Jamaica, N. Y., 43 two story houses in area bounded by 58 Ave., 184 St., North Hempstead Turnpike and Utopia Parkway. $430,000.

N. C., Raleigh—OFFICE—Occidental Life Insurance Co., Laurence F. Lee, pres., Professional Bldg., office bldg., 4½ acre tract in Cameron Village.

Pa., Phila.—HOME—Baptist Home of Phila., Roosevelt Blvd. and Pennypack Circle, plans by Horace W. Castor, 1700 Walnut St., Baptist home expansion. $600,000. CD 3/22.

Pa., Phila.—STORES and APARTMENTS—Herbert F. Diener & Co., Fidelity Phila. Trust Bldg., 16 stores and apartments, Castor Ave. $400,000.

▲ **Pa., Morrisville**—COMMUNITY—Danherst Corp., John W. Galbreath, pres., 42 E. Gay St., Columbus, O., community for employees of Fairless Works, to have 4,000-5,000 houses, water sys., sewage disposal plant, shopping center, schools, churches, etc. Approx. $5,000,000. Seward H. Mott, 1737 K St. N.W., Wash., D. C. consult engr.

▲ **Tenn., Memphis**—APARTMENT—Sam Bilao, 23 S. Pauline St., apartment. $1,000,000.

▲ **Tex., Fort Worth**—DWELLINGS—Thomas M. Ryan & Co., 801 Commerce St., Proj. No. 1, 75 frame type dwellings, concrete slab fdn. $600,000; Proj. No. 2, 100 frame, asbestos dwellings, concrete slab fdn. $800,000; Proj. No. 3, 90 frame dwellings, concrete slab fdn. $720,000; Proj. No. 4, 125 frame, masonry dwellings, concrete slab fdn., $1,000,000. in new 150 acre portion of Southland Terrace Addn.

Tex., Houston—DWELLINGS—The Ayrshire Corp., 6825 Academy St., 53 dwellings on Drummond Ave. in Ayrshire Addn. $365,000.

Tex., Houston—DWELLING—S. W. Bennett, 4806 Spruce St. 8 two-story masonry high-priced dwellings, in new area Afton Oaks. $300,000.

Tex., Houston—DWELLINGS—J. P. Boone, 3730 Purdue St. 10 high priced masonry 2 story bsmnt. dwellings, in new portion of Afton Oaks, $325,000.

Tex., Houston—DWELLINGS—McMillan Homes, Inc., 6042 Southlea St., 62 addnl. frame dwellings, on Southeast, Southwind, Pershing, Southlea Sts. $547,500.

Tex., Houston—DWELLINGS—R. A. McWilliams, M. Esperson Bldg., 80 frame (Negro) dwellings, asb. conc. slab fdn., in portion of Galena Manor. $560,000.

Tex., Houston—DWELLINGS—Charles Olds, 3425 University St. dwelling project in new area Afton Oaks, $310,000.

Tex., Houston—DWELLINGS—Frank Teague, Union Natl. Bank bldg., 90 frame, Negro dwellings, conc. slab fdn. in Galena Manor area. $630,000.

Tex., Houston—DWELLINGS—Paul H. Wolf, 2438 W. Alabama St., 110 frame (Negro) dwellings, asb. conc. slab fdn., 1000 blk. Clinton Dr. $770,000.

Tex., Kerrville—SCHOOL—Tenny School for Boys, Ingram, plans by Addis E. Noonan Assoc., American Hospital & Life Insurance Bldg., San Antonio, masonry and frame school. $400,000.

▲ **Tex., Pasadena**—DWELLINGS—Joe H. Vickers, 1507 Delano St., Houston Unit 1, 75 dwellings, $395,000; Unit 2, 100 dwellings, $900,000; Unit 3, 90 dwellings $810,000; Unit 4, 60 dwellings, $540,000 on 100-acre tract outside city limits.

Tex., San Antonio—HOUSING—Kinder Constr. Co., 4803 Blanco Rd., frame housing, concrete slab fdn. $310,000.

▲ **Va., Richmond**—HOSPITAL—St. Philip Hospital, 1207 E. Marshall St., Richmond, 200-bed hospital addn. Approx., $1,500,000.

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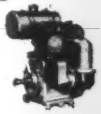
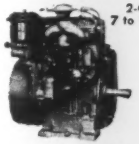
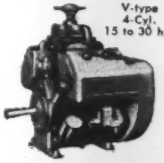

Single Cyl. 3 to 9 hp.


2-Cyl. 7 to 13 hp.


V-type 4-Cyl. 15 to 30 hp.

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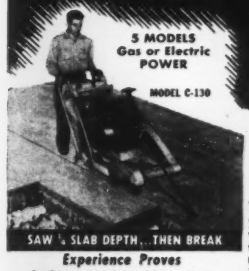

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▲ **Alaska, Anchorage**—APARTMENTS—Lewis Constr. Co., Lowman Bldg., Seattle, Wash., plans by E. W. Morrison, 719 Second Ave. Bldg., Seattle 4, Wash., 8 bldgs. for 5 & 5 apartments, with 224 one-bedroom units and 45x180 ft. 1 story shopping center, $3,000,000. CD 4/9.

INDUSTRIAL BUILDINGS

Ala., Birmingham—PLANT—American Vitrified Products Co., Natl. City Bank Bldg., plant, $400,000.

Ark., Crossett—MILL—Crossett Paper Mill, Crossett, reconstruction portions mill, over $100,000.

Calif., Anaheim—PLANT—Daystrom-Balboa Corp., Fullerton, plans by Stiles Clements, Van Nuys Bldg., Los Angeles, 1 story, brick, concrete mfg. plant, $400,000.

Calif., Vernon—WAREHOUSE—Wesco Merchandising Co., Co., 1035 S. Los Angeles St., Los Angeles, Calif., precast concrete warehouse. $140,000. Wm. P. Neil Co. Ltd., 4814 Loma Vista Ave., consult. engr.

Conn., New Haven—PLANT—United Illuminating Co., 80 Temple St., power plant addn., English Point Station addn., incl. 30,000 kw. turbine generator Westcott & Mapes, Inc., 109 Church St., New Haven, Conn., consult. engr. and archt.

Conn., Plainville—PLANT—Martin Rockwell Corp., Standard Div., Woodford, N. J., 1 story, 171x200 ft., brick, cinder block, plant addn. and office.

Conn., South Norwalk—INDUSTRIAL—Burndy Eng. Co., 107 Bruckner Blvd., New York, N. Y., plans by Julius Eckman, 51 E. 42 St., New York, N. Y., 1 story, 50,000 sq. ft. brick, concrete industrial bldg. $250,000. E. V. Markush, 138 Lexington Ave., New York, N. Y., mech. engr.

Ga., Atlanta—WAREHOUSE, etc.—Southern Scientific Co., 188 Walto St. N. W., warehouse and office. $112,000.

▲ **Ga., Columbus**—PLANT—Wells Dairies Co-operative, 2320-30 Wynnton Rd., plans by E. Oren Smith, 17 W. 12 St., Columbus, dairy plant, $1,500,000. CD 9/6/49.

Ky., Glasgow—MILL—Old Planning Mill Co., Glasgow, rebuild mill, $100,000.

Ky., Louisville—BUS STORAGE and SERVICE GARAGE—Southeastern Greyhound Lines, 434 W. Broadway, plans by W. S. Arrasmith, 410 Lincoln Bank Bldg., 1 and 2 story, 160x169 ft., concrete block bus storage and service garage, $200,000. CD 9/6/49.

▲ **La., Baton Rouge**—PLANT—Naugatuck Chemical Co., U. S. Rubber Co., 1230 Ave. of Americas, New York, N. Y., plant addn., $2,000,000.

Mich., Birmingham — GARAGE-SHOWROOM — Wilson Pontiac-Cadillac Inc., 275 N. Woodward St., Detroit, plans by Swanson Associates, West Long Lake, Bloomfield Hills, 1 story, concrete, masonry garage-showroom, $100,000.

▲ **Mich., Muskegon**—PLANT—Continental Motors Corp., 1470 Algonquin St., Detroit, 1 story, masonry engine testing plant addn. $2,000,000.

Miss., Moss Point—PLANT—Tuna, Inc., c/o Cecil Drake, Moss Point, packing plant. $500,000.

Mo., Independence—FOUNDRY—National Aluminum & Brass Foundry, 1311 W. Elm St., plans by R. P. Weatherford and Victor De Foe, 206 N. Liberty St., foundry. CD 3/14.

Neb., Kearney—GRAIN ELEVATOR—Mack Elevator Co., Bernard, Mack, mgr., Kearney, grain elevator. $400,000.

▲ **N. Y., Glenwood Landing**—GENERATING PLANT—Long Island Lighting Co., 250 Old Country Rd., Mineola, electric generating plant in Hempstead Harbor. $35,000,000.

N. Y., Jamaica—MACHINE SHOP, etc.—N. Lipschutz, c/o Lama, Proskauer & Prober, archts., 383 Pearl St., Brooklyn, Zone 1, 100x120 ft. machine shop, storage, repairs, etc. Hillside Ave. east of 150 St. $250,000.

▲ **N. Y., Jamesville**—PLANT—Alpha Portland Cement Co., Easton, Pa., cement plant. $3,000,000.

N. C., Sanford—PLANT—Burlington Mills Corp., Greensboro, textile plant. Approx. $500,000.

▲ **Pa., Coatesville**—PLANT—Lukens Steel Co., Coatesville, sodium hydrate bldg. extension. $4,000,000. N. J. Jenson c/o owner, ch. engr.

Pa., Neville Island (br. Pittsburgh)—WAREHOUSE—The Carborundum Co., 420 Blvd of Allies, Pittsburgh, 1 story, approx. 25,000 sq. ft. brick, concrete warehouse, $250,000. Brown & Matthews, Inc., 122 E. 42 St., New York, N. Y., engr.

▲ **Pa., Phila.**—PLANT—National Union Radio Corp., Hatboro, Pa., plans by M. Ward Easby, 16 S. Broad St., mfg. plant, Rhawn and Dungan St., $6,000,000.

▲ **Pa., Zelionople**—MANUFACTURING—Halstead & Mitchell, Bessemer Bldg., Pittsburgh, 380,000 sq. ft. 1 story, steel, brick, block, refrigeration mfg. bldg. $3,000,000.

Tex., Amarillo—WAREHOUSE—George Martha & Melody McCormick Trust Co., Amarillo, 1 story, 133x300 ft. masonry warehouse, concrete slab fdn., 401-11 N. Arthur St. $100,000.

Tex., Corsicana—FACTORY—Texas Millers Products, Inc., Corsicana, reconstructing hat mfg. factory. $300,000.

Tex., El Paso—FREIGHT TERMINAL—Braswell Motor Freight Lines, 300 S. Campbell St., motor freight terminal. $375,000. R. A. McGarry & Assoc., 3908 Lemmon St., engrs. and archts.

Tex., Houston—GARAGE—Allright, Inc., 913 San Jacinto St., 5 level parking garage, San Jacinto and Lamar Sts. $250,000.

Tex., Kenedy—STORAGE HOUSE—Kenedy Cotton Oil Mill, Kenedy, seed storage house. $850,000. F. P. Downey, c/o owner, engr.

▲ **Tex., Midland**—PLANT—Tex-Harvey Gasoline Co., Midland, gasoline plant (high-pressure absorption type). $5,750,000.

Tex., Odessa—PLANT—Odessa Natural Gasoline Co. & Sid Richardson Carbon Co., Odessa, sulphur plant, for recovery crude sulphur from waste gases at Casinghead Gasoline Plants, near here. $200,000.

▲ **Va., Richmond**—PLANT—Manchester Board & Paper Co., Inc., Canal St. near Hull, plant. $4,000,000.

Wash., Seattle—PLANT—Huntington Rubber Mills, Inc., 35 W. Lander St., 1 story concrete plant. $125,000.

Wash., Seattle—WAREHOUSE, etc.—Sylvania Electric Products Inc., Stuart Bldg., Zone 1, warehouse and service center, $500,000.

Wash., Tacoma—WAREHOUSE—Love Electric Co., 1940 Market St., wholesale warehouse. $117,000.

Wis., Kenosha—SHIPPING, etc.—Nash-Kelvinator Corp., 5626 25 Ave., 2 story 300,000 sq. ft. shipping bldg., 1 story, 150,000 sq. ft. manufacturing bldg., 1 story, 110,000 sq. ft. manufacturing bldg. V. E. Alden Co., 120 S. LaSalle St., Chicago, Ill., and Shaw, Metz & Dolio, 208 S. LaSalle St., Chicago, Ill., consult. engrs. C. E. Flug, c/o owner, engr.

Wis., Rhinelander—WAREHOUSE—Valley Queen Stores, Rhinelander, 1 story 100x200 ft., steel, blocks warehouse. Genisot Eng. Co., Rhinelander, consult. engr.

▲ **B. C., Nanaimo**—MILL—Nanaimo Sulphate Pulp Ltd. 837 W. Hastings St., Vancouver, sulphate mill exten. $16,000,0000.

▲ **B. C., Port Alberni**—MILL—Bloedel, Stewart & Welch Ltd., Standard Bldg., Vancouver, and H. R. MacMillan Export Co., plywood Mill at existing plant here, Approx. $2,250,000.

Ont., Ajax—PLANT ADDN.—Cambri Manufacturing Co. Ltd., Ajax, plans by R. A. Fisher, 1071 Yonge St., Toronto, 1 story L-shaped, 241x341 ft., brick, concrete block Approx. $200,000.

▲ **Ont., Toronto** — PLANT — Canadian Steel Improvement Ltd., subsidiary Steel Improvement & Forge Co., 970 E. 64 St., Cleveland, O., U. S. A., jet engine parts plant, 2 and Horner Aves., Etobicoke Twp., near here, $2,000,000.

Ont., Toronto—PLANT—Dearborn Chemical Co., Ltd., 2454 Dundas St. W., chemical plant, on 10-acre site, Etobicoke Twp. Lester B. Knight & Assocs., 600 W. Jackson St., Chicago, Ill., U. S. A. consult. engr. CD 1/23/46.

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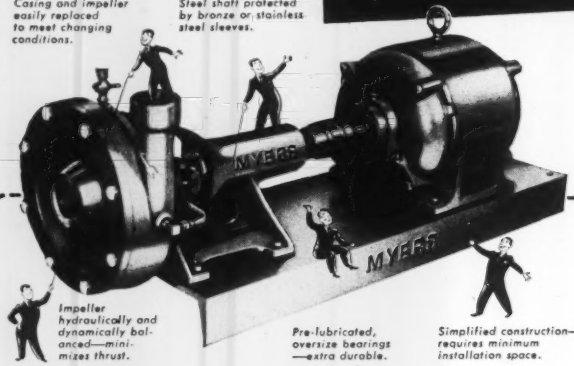
NEW MYERS centrifugal pumps!



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Pre-lubricated, oversize bearings —extra durable.

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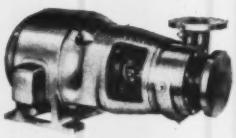

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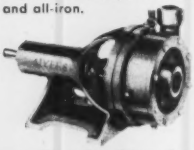

New Myers Belt-Driven Centrifugals: V-belt or flat-belt drive. Oversize shaft is removable from either end of pump. Types to handle many different liquids at temperatures to 220° F.

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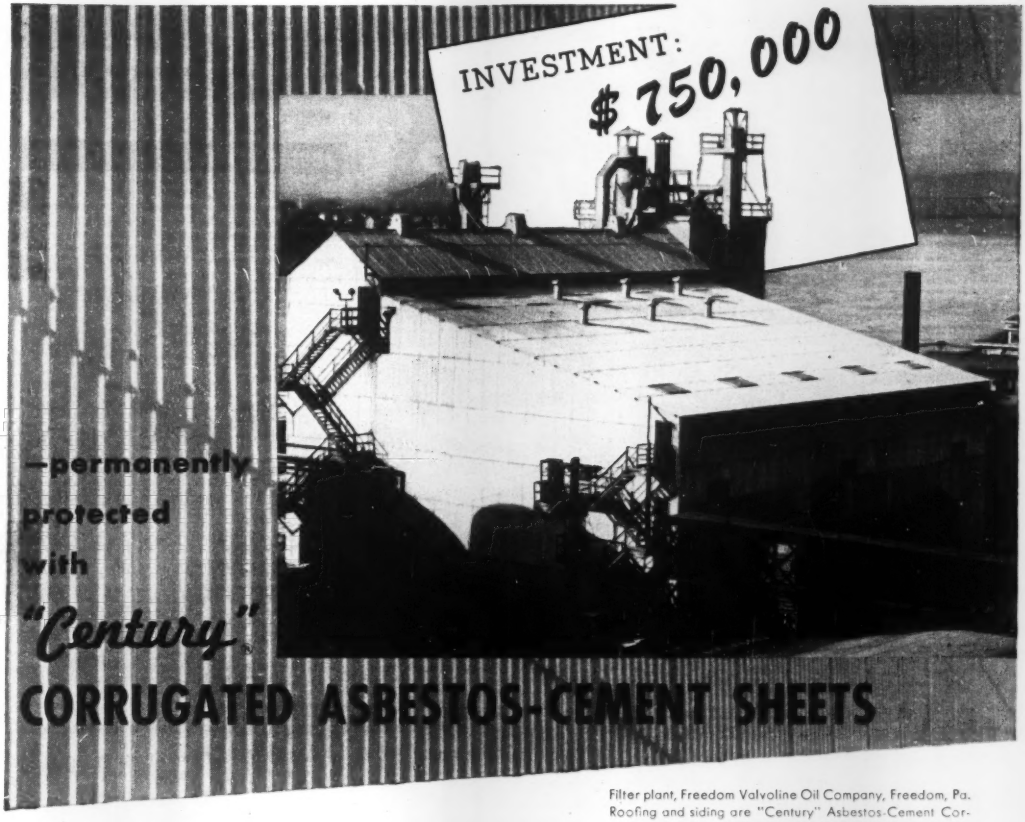

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▲ **Que., Natashquan**—PLANT—E. Jean Olivier, co owner with C. E. Prefontaine, c/o 3437 Park Ave., Montreal, magnetic concentrator plant. Approx. $1,500 000-$2,000,000.

Que., Shawinigan Falls—FREIGHT SHED—B. Wheelwright, ch. engr. Canadian National Rys., 360 McGill St., Montreal, new freight shed. Approx. $300,000.

UNCLASSIFIED

▲ **Ark., Mena**—TRANSMISSION LINE—City, voted bonds, transmission line DeQueen to Mena for natural gas and distr. sys. $1,380,000. CD 3/14.

Kansas—RURAL DISTRIBUTION LINES—C. M. S. Electric Co-operative, Meade, 101 mi. rural distr. lines, sys. imprvs., Meade Co. $155,000.

Kansas—RURAL DISTRIBUTION LINES—O. M. S. Electric Co-operative, Meade, 101 mi. rural distr. lines, headquarters, Meade Co. $155,000. Frank Horton & Co., Lamar, Mo., consult. engrs.

Kansas—RURAL DISTRIBUTION LINES—R. R. & W. Electric Co-operative Assn., Wamego, 41 mi. rural distr. lines, headquarters, sys. imprvs., Pottawatamie Co. $140,000. Frank Horton & Co., Lamar, Mo., consult. engrs.

Ky., Brownsville—TELEPHONE SYSTEM—Elmore Telephone Co., Brownsville, expansion rural telephone sys., $420,000.

▲ **Ky., Louisville**—TRAIN YARDS—Louisville & Nashville R. R. Co., C. H. Blackman, ch. engr., 9 St. and Broadway, plans by J. C. Haly, 9 St. and Broadway, enlargement train yards at Strawberry Station, near here, $1,000,000.

Nebraska—RURAL DISTRIBUTION LINES—Cedar-Knox Rural Public Power Dist., Hartington, Neb., 265.2 mi. rural distr. lines, Cedar, Knox, Pier and Dixon Counties. $200,000. Henningson, Durham & Richardson, Standard Oil Bldg., Omaha, Neb., consult. engrs.

N. Y., New York—DECKING OVER RAILROAD TRACKS—The Port of New York Auth., 111 8th Ave., Zone 11, constructing decking over New York Central R.R. tracks, providing addnl. entrance to Lincoln Tunnel Plaza from W. 41 St. between 10 and 11 Aves. Approx. $900,000.

N. C., Asheville—RAIL YARDS—Southern Railway System, J. B. Akers, ch. engr., P. O. Box 1808, Wash. 13, D. C. reconstruct rail yards. $500,000.

† **Oregon**—RAILROAD REHABILITATION—U. S. Eng., 4735 E. Marginal Way, Seattle, 4, Wash., railroad rehabilitation Umatilla Ordnance Depot, Ordnance, Serial No. ENG 45-108-51-147.

South Carolina—RURAL DISTRIBUTION LINES—Broad River Electric Co-operative, Gaffney, 46 mi. rural distr. line and sys. imprvs., Cherokee Co. $210,000.

S. C., Abbeville—GAS SYSTEM—City, natural gas sys. $750,000.

S. C., Belton—GAS SYSTEM—City, natural gas sys. $425,000.

▲ **S. C., Greenwood**—GAS SYSTEM—City, natural gas sys. $3,930,000.

S. C., Honea Path—GAS SYSTEM—City, natural gas sys. $270,000.

S. C., Ninety Six—GAS SYSTEM—City, natural gas sys. $130,000.

▲ **Texas, Oklahoma, Kansas, Colorado, Wyoming, Oregon and Washington**—GAS PIPE LINE—Pacific Northwest Pipeline Corp., c/o Robert R. Herring, Esperson Bldg., Houston, Tex., 2,175 mi. 26 in. welded joint natural gas pipe line carrier from Wharton, Tex. to vicinity Spokane, Wash. $174,186,602. Fish Eng. Corp., M & M Bldg., Houston, Tex., consult. engrs.

Texas—RURAL DISTRIBUTION LINES—Rio Grande Electric Co-operative, Bracketville, 490 mi. rural distr. lines, other imprvs., Kinney Co. $760,000. CD 11/16.

Tex., Cushing—NATURAL GAS SYSTEM—City, c/o Byford Bates, mayor, natural gas sys. incl. transmission lines, regulator stations and distr. sys. $125,000. Allied Engineers, Inc., 1410 Fort Worth Natl. Bank Bldg., Fort Worth, consult. engr.

Tex., Houston—FIRE ALARM SYSTEM—City, Oscar Holcombe, mayor, City Hall, 900 Brazos St., bond election May 29, electric fire alarm sys. imprvs. $200,000. L. Fugate, city engr. CD 7/31/46.

Tex., Houston—TRAFFIC SIGNAL SYSTEM—City, Oscar Holcombe, mayor, City Hall, 900 Brazos St., bond election May 29 expansion electric traffic signal sys. $500,000. L. Fugate, city engr. CD 5/16/49.

Tex., Wichita Falls—MOTOR COURT—Ralph E. Bullington, Wichita Falls, motor court. $310,000.

▲ **West Virginia**—RAILROAD TRACKS—Norfolk & Western Ry., A. B. Stone, ch. engr., Roanoke 17, Va., straightening 5 mile stretch railroad tracks between Lick Branch and Northfork, W. Va. $3,500,000.

† **Alaska, College**—STEAM and ELECTRIC GENERATING PLANT—Alaska Pub. Wks., Dpt. Interior, Juneau, steam and electric generating plant and distr. sys. for University of Alaska Campus, Proj. 50-A-117. $208,350. V. Rivers, Central Bldg., Juneau, consult. engr. CD 3/15.

▲ **Saskatchewan**—GAS PIPE LINE—Western Pipe Lines, c/o Allison & Campbell, 333 Main St., Winnipeg, Man., gas pipe line from Clavelin Sask., to Prince Albert via Saskatoon, Sask. $10,000,000.

CONSTRUCTION REPORTS-Second Section

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
May 8—Massachusetts
STREETS AND ROADS
May 7—Connecticut
May 8—Massachusetts

† **Mass., Boston**—B.A. 5/15—Dist. Pub. Wks. Offices, First Naval Dist., 495 Summer St., repairs to fuel pier and shore line, U. S. Naval Fuel Facility, Boston Naval Shipyard, Noy 24310, Spec. 26606. Plans deposit $10.

LOW BIDDERS—BUILDINGS

▲ **Concrete Constr. Co.**, 11 Garfield, Ave., Chelsea, Mass. Low Bidder. **$1,041,000.** veterans' HOUSING Proj. PHA 14-1, Rose, Hutchinson Sts. and Stanton Ave., REVERE, MASS. City of Revere Housing Auth., J. L. Meehan, ch., Revere, Mass. Bids Apr. 18, CD 3/22.

CONTRACTS—HEAVY CONSTRUCTION

Warner Bros., Inc., Sunderland, Mass. Contract Awarded. **$79,584.** bridge and approaches, Easthampton, MASSACHUSETTS. Commonwealth of Mass., Dpt. Pub. Wks., 100 Nashua St., Boston, Mass. Bids Apr. 3. CD 3/21.

Frank B. Crowley, Inc., 800 Central St., Leominster, Mass. Contract Awarded. **$152,318.** bridge and approaches, Winchendon, MASSACHUSETTS. Commonwealth of Mass., Dpt. Pub. Wks., 100 Nashua St., Boston, Mass. Bids Apr. 3. CD 3/21, under Streets & Roads.

Eastern Tree & Landscape Corp., 280 Bridge St., Dedham, Mass. Contract Awarded. **$73,889.** landscape work, Proj. 200-2, Boylston and Tacoma Sts., WORCESTER, MASS. City of Worcester, Housing Auth., City Hall, Worcester, Mass. Homer K. Dodge, 129 Concord St., Framingham, Mass., landscape archt.

CONTRACTS—BUILDINGS

▲† **Gust K. Newberg Constr. Co.**, 2040 N. Ashland St., Chicago, Ill. Contract Awarded. **$17,737,000.** HOSPITAL bldgs., utilities, Manly and West Chester Sts., BROCKTON, MASS. Veteran's Admin., Technical Service, Munitions Bldg., Wash. D. C. CD 4/12 under L. B.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
May 15—New Jersey
STREETS AND ROADS
May 15—New Jersey-Maryland

† **Pennsylvania**—B.A. 5/9—U. S. Eng., 121 N. Broad St., Phila. Zone 1, maintenance dredging in the Delaware River opposite Marcus Hook, approx. 21 mi. downstream from the Philadelphia-Camden highway bridge crossing Delaware River at Phila. Inv. No. Civ Eng 36-109-51-67.

N. J., Camden—B. A. 5/7—South Jersey Port Comn., foot of Beckett St., Camden, maintenance dredging in Delaware River, Approx. $75,000.

BIDS ASKED—BUILDINGS

† **D. C., Wash.**—HEATING PLANT—B.A. 5/10—P. Wks. Office, Potomac River Naval Command, Naval Gun Factory, heating plant, Quarters A Spec. 29346. Plans deposit $10.

LOW BIDDERS—BUILDINGS

Bd. Educ., 21st and Winter Sts., Phila. Pa., rejected bids March 27, Frankford HIGH SCHOOL addns. and alteratons. PHILA. PA. Will re-advertise. CD 3/22.

Fram's Dairies Inc., Vandever & La Motte Sts., Wilmington, Del., rejected bids, garage bldg., Approx. **$92,000.** WILMINGTON, DEL. Wm. F. Koeller Sons Western Saving Fund Bldg., Phila., Pa., engrs.

CONTRACTS—HEAVY CONSTRUCTION

▲ **Hendrickson Brothers, Inc.**, 63 N. Central Ave., Valley Stream, N. Y., Contract Awarded, **$1,896,701.** 2½ mi. of Captree State Parkway between Montauk Hy. and Southern State Parkway, Suffolk Co. NEW YORK. Bureau Contracts & Accounts, Albany, N. Y. Bids Feb. 14. Awarded March 29. CD 2/16. under LB.

▲ **Walsh Constr. Co., Senior & Palmer and Peter F. Connally Co.**, 1 E. 43 St., New York 17, N. Y. Contract Awarded. Approx. **$4,000,000.** Five river piers for new 4 track vertical lift bridge over Harlem River at E. 133 St., NEW YORK, N. Y. New York Central System, G. A. Noren, ch. engr., 466 Lexington Ave., New York 17, N. Y.

CONTRACT—BUILDINGS

▲ **White Constr. Co.**, 95 Madison Ave., New York 16, N. Y. contract Awarded, Approx. **$1,500,000.** 4 story POST OFFICE, 34th W. 42 St., NEW YORK, N. Y. Webb & Knapp, Inc., 383 Madison Ave., New York 17, N. Y. CD 2/12.

John Sabot, 1035 Adeline St., Trenton, N. J., Contract Awarded Approx. $150,000, two 1 story, 150x260 ft., block, brick steel FACTORY bldgs., TRENTON, N. J. Stanley Switlik, Larar and Hancock Sts., Trenton, N. J. Bids Apr. 16. CD 3/30.

Gumina Bldg. & Constr. Co., Larch Ave., New Brunswick, N. J. Contract Awarded. **$674,028.** Five 3 story APARTMENTS incl. 102-low-rent apartments on John Fitch Way at S. Warren St., TRENTON, N. J. Trenton Housing Auth., 875 New Willow St., Trenton, N. J. Bids Mar. 22, awarded Apr. 19. CD 3/28, under LB.

William M. Frost Co., Welsh Rd. and Montague St., Phila. Pa., Separate Contracts. Approx. **$82,000.** 1 story 80x163 ft. masonry lumber and millwork WAREHOUSE, PHILA. PA. CD 2/2.

Duffy & Patton, 69 and Walnut Sts., Upper Darby, Pa., Separate contracts. Approx. **$300,000.** RESIDENTIAL DEVELOPMENT, 4th and Carlisle Aves., PROSPECT PARK, PA.

Merritt & Glover, Inc., 6905 York Rd., Baltimore 12, Md. Owner Builds. **$474,200.** Twenty-two 20x30 ft., thirty-six 20x30 ft., masonry row type DWELLINGS, 5400 and 5500 blocks, Leith Rd., 1400 Woodbourne Ave., 5400 and 5500 blocks, Woodmont Ave., BALTIMORE, MD.

† **Kirby & McGuire, Inc.**, 2518 Maryland Ave., Baltimore, Md. Contract Awarded. **$422,404.** Rehabilitation two inert, concrete substructure, prefabricated steel superstructure storage WAREHOUSES, 4 underground magazines, alterations to change house and boiler house, Edgewood Chemical Center, 2nd phase, EDGEWOOD, MD. U. S. Eng., 24 and Marylan Ave., Baltimore 18, Md. Fenton & Lichtig, 2023 Maryland Ave., Baltimore, Md., archts., Turpin, Wachter & Assoc., 1004 N. Charles St., Baltimore, Md., mech. engrs., Rummell Klepper & Kahl, 1021 N. Calvert St., Baltimore, Md., civil engrs. CD 3/1.

▲ **Cleveland Yerger Co.**, 1337 72 Ave., Phila. Pa., Contract Awarded, **$2,500,000.** RESIDENTIAL DEVELOPMENT, Meadowbrook sect., Meetinghouse Rd. and 2nd St., RYDAL, PA. Isard-Risen Co., 6161 N. 16 St., Phila. Pa.

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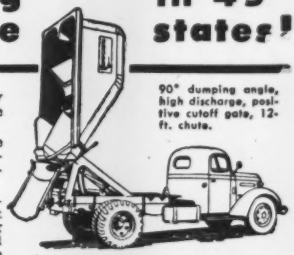

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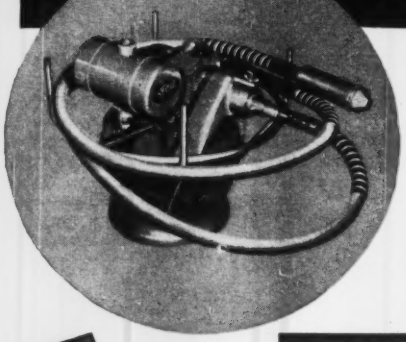

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SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES

May 8—West Virginia
May 16—Louisiana
May 25—Georgia

STREETS AND ROADS

May 8—West Virginia
May 10—Florida
May 11—Kentucky
May 16—Louisiana
May 18—Mississippi-Tennessee

† Ga., Hinesville—FLOORS, etc.—B.A. 5/8—U. S. Eng., P. O. Box 889, Savannah, tent floors and frames at Camp Stewart.

† Ky., Camp Breckinridge—BUILDINGS—B.A. 5/9—U. S. Eng., P. O. Box 59, Louisville, Zone 1, rehabilitation of bldgs. Areas G and N, Eng. 15-029-51-48.

La., Baton Rouge—ADMINISTRATION BLDG.—B. A. 5/8—City, 3rd stage, admin. bldg., Harding Field. Plans deposit $15. A. Hays Town, Masonic Bldg., archt. CD 12/28/44.

La., Jennings—B.A. 5/8—City, city council, asph. street surf., Barnard & Burk, 1023 Nickolson Drive, Baton Rouge, engrs.

La., Monroe—B. A. 5/8—City, alterations addns. to sanitary sewer sys., sanitary sewer facilities in Sewer Dist. H. Plans deposit $15. Barnard & Burk, 1023 Nicholson Dr., Baton Rouge, engrs.

La., Shreveport—B. A. 5/9—Caddo Parish, c/o parish engr., Court House, grading, paving 5.82 mi. on Woolworth Rd., Proj. 1-1951.

Miss., Jackson—B. A. 5/14—City, c/o city engr., City Hall, water mains on various streets, Proj. 4-W. Plans deposit $10. CD 8/11.

LOW BIDDERS—HEAVY CONSTRUCTION

▲ State Rd. Dpt., George Washington Hotel, Jacksonville, Fla., rejected bids Apr. 12, constr. both substructure and superstructure, for 4250 ft. long low level bridge from foot of Gilmore St. across St. Johns River to Southside of Jacksonville. L. B. $5,207,832. FLORIDA. CD 4/17, under LB.

LOW BIDDERS—BUILDINGS

▲ Seth E. Giem & Assoc., 801 Roland St., Memphis, Tenn. Low Bidder. $2,698,912. 300 HOUSING units, PADUCAH, KY. Paducah Municipal Housing Comm., Paducah, Ky. Bids Apr. 17. CD 3/23.

▲ Stone & Webster Engineering Corp., 49 Federal St., Boston, Mass., Low Bidder, Approx. $1,280,000. POWER PLANT addn. CHESTER, VA. Virginia Electric & Power Co., 7 and Franklin Sts., Richmond, Va.

▲ Norfolk Redevelopment & Housing Auth., Norfolk, Va., rejected bids Apr. 4. Housing Proj. VA. 6-4, NORFOLK, VA. L. B. $1,563,633. CD 4/11, under LB.

▲ Dwight L. Phillips, 308 W. Palmer St., Charlotte, N. C. Low Bidder. $8,648,335. Construct, manage, finance military HOUSING project, 606 family dwelling units; 815 family dwelling units, CHERRY POINT, N. C. Pub. Wks. Officer, Sixth Naval Dist., Naval Base, S. C. Bids April 18. CD 3/16.

Greensboro Housing Auth., Greensboro, N. C. rejected bids Jan. 17. L. B. $559,900. Proposal 1; $520,000 Proposal 2, heating for HOUSING project., GREENSBORO, N. C. CD 2/1, under LB.

▲ Perriliatt-Rickey Constr. Co., Box 7072, New Orleans, La. Low Bidder. $1,295,000. DORMITORY, MOBILE, ALA. Spring Hill College, Spring Hill, Ala.

Hargett Constr. Co., 113 Walton Ave., Lexington, Ky. Low Bidder. $461,842. 3 story, bsmt., 95x100 ft. Y. M. C. A. BLDG., LEXINGTON, KY. Young Mens Christian Assn., 489 E. Main St., Lexington Fayette Co., Lexington, Ky. Bids Apr. 20. CD 4/3.

First Baptist Church, Town Hall, Oak Ridge, Tenn. Received no bids Apr. 10. Church, OAK RIDGE, TENN. $300,000. CD 4/12.

CONTRACTS—HEAVY CONSTRUCTION

▲ G. E. Moore, Greenwood, S. C. Contract Awarded, $1,365,252. sanitary sewer extens., FLORENCE, S. C. City, City Hall, Florence, S. C. Bids April 4. CD 4/11. under LB.

▲ Diamond Constr. Co., 14 & M Sts. S. E., Wash., D. C. Contract Awarded, $1,179,668. sub-structure of 4250 ft. long low-level bridge from foot of Gilmore St. across St. Johns River to southside Jacksonville, Duval Co. FLORIDA State Rd. Dpt., George Washington Hotel, Jacksonville, Fla. Bids Apr. 12, awarded Apr. 25. CD 4/4.

CONTRACTS—BUILDINGS

▲ J. W. Daniels Co., Danville, Va. Contract Awarded. Approx. $1,257,000. HIGH SCHOOL on Hydraulic Rd., CHARLOTTSVILLE, VA. Albemarle Co., Charlottsville, Va. Bids Apr. 16. CD 4/23.

▲ Worth D. Kenyon Constr. Co., 815 Capitol City Club Bldg., Raleigh, N. C. Contract Awarded. $1,212,625. temporary emergency BARRACKS, CAMP LEJEUNE, N. C. Pub. Wks. Office, Bldg. No. 1005. Marine Barracks, Camp Lejeune, N. C. CD 4/16 under LB.

▲ Cooper Agency, Inc., 1218 Washington St., Columbia, S. C. Contract Awarded, $4,194,000. construct, manage, finance HOUSING project, SHAW FIELD, S. C. U. S. Eng., South Atlantic Div., Box 1889, Atlanta, Ga. CD 3/27 under LB.

▲ **Algernon Blair Constr. Co.,** First National Bank Bldg., Montgomery, Ala. Contract Awarded. $1,500,000. 296 unit Linwood APARTMENT, 76 unit Madison Park APARTMENTS, SHREVEPORT, La. Brentwood Arms, Inc., Southwest Shreveport, La. Awarded Apr. 15.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
May 22—Wisconsin
STREETS AND ROADS
May 2—Michigan-Wisconsin

Mich., Detroit—B.A. 5/8—City, Carl D. Warner, comr., Dpt. Pub. Wks., 104 City Hall, 372,685 sq. ft. 4 in. concrete sidewalks, 52,615 sq. ft. 6 in. concrete driveways, 13,155 sq. ft. 8 in. concrete driveways, George R. Thompson, City Hall, city engr. CD 12/21/44.

Wis., Eau Claire—B.A. 5/9—City, 15,100 ft. 2- to 12-in. watermains; 7 mi. 8- to 12-in. sewer. Plans deposit $25.

Wis., Owen—B.A. 5/14—City, sewage treatment plant, sewers $200,000. S. P. Hall, 128 Graham Ave., Eau Claire, consult. engr. CD 10/4/45.

BIDS ASKED—BUILDINGS

▲ **Ill., Des Plaines**—SCHOOL—B.A. 5/8—School Dist. No. 62, Des Plaines, 2 story, steel, brick, concrete, stone, North Side Grade school, Dempster and Potter Rds. $2,500,000. Childs & Smith, 20 N. Wacker Dr., Chicago, Zone 16, archts. CD 2/8.

O., Petersburg—ELECTRICAL WORK—B.A. 5/10—Bd. Educ., Springfield Twp. School Dist., Petersburg (1) electrical work for addn. to New Springfield School; (2) electrical work for addn to New Middletown School; (3) alterations to high school. Plans deposit $15. Arsene Rousseau, 213 Mahoning Bank Bldg., Youngstown, archt.

LOW BIDDERS—HEAVY CONSTRUCTION

Lueck Constr. Co., 3510 W. Kiehman Ave., Milwaukee, 9, Wis., Low Bidder, **$701,000**, water filtration plant; Pittsburgh-Des Moines Steel Co., 38 S. Dearborn St., Chicago, Ill., **$102,500**, elevated water storage tank, CUDAHY, WIS. City, City Hall, Cudahy, Wis. Bids Apr. 17. CD 2/14.

▲ **Wilsbach Corp.,** 4622 Calumet Ave., Hammond, Ind. Low Bidder. **$1,900,000**. sewage treatment works, BENTON HARBOR AND ST. JOSEPH, MICH. Cities Benton Harbor and St. Joseph, Mich. Bids Apr. 9. CD 2/8.

LOW BIDDERS—BUILDINGS

A. E. Kemmer, 208 Brown St., Lafayette, Ind., Low Bidder, **$669,200**, est. $500,000 2 story 105x134 ft., brick, rein.-con. structural steel, HIGH SCHOOL, WEST LAFAYETTE, IND. Bd. School Trustees, Karl Kettlehist, pres., High School, West Lafayette, Ind. Walter Scholer & Assocs., 1114 State St., Lafayette, archts.

CONTRACTS—BUILDINGS

▲ **Robin Constr. Co.,** 1009 N. Wells St., Chicago, Ill., Contract Awarded, **$1,574,000**, erecting 154 HOUSING UNITS, SPRINGFIELD, ILL. New Harrison Home Development, Springfield, Ill.

▲**H. K. Ferguson Co.,** 11 at Walnut Sts., Chicago, Ill., Contract Awarded, **$1,000,000**, 1 story 282x502 ft., structural steel frame, concrete factory and work shop, near UNION CITY, IND. Westinghouse Electric Co., Union Bank Bldg., Pittsburgh, Pa. CD 1/3.

▲ **Sumner Sollitt & Co.,** 307 N. Michigan St., Chicago 1, Ill. Contract Awarded. **$7,500,000**. paper mfg. PLANT, FILER CITY, MICH. American Box Board Co., 5950 W. 51 St., Chicago, Ill. H. K. Ferguson Co., 1220 S. La Salle St., Chicago 3, Ill., engrs. Awarded Apr. 4.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
May 8—Oklahoma
May 11—Kansas
STREETS AND ROADS
May 8—Oklahoma
May 11—Kansas
May 15—Texas
May 16—Texas
May 18—South Dakota

† **Texas**—B.A. 5/11—U. S. Dpt. Agriculture, Soil Conservation Service, 3600 McCart St., Fort Worth, flood control detention reservoirs, earthfill embankments, etc., on West fork of Trinity River, approx. 12 mi. northeast of Jacksboro.

Tex., Plano—B.A. 5/11—City, Plano asph. type street paving. $60,000. Homer A. Hunter, 4704 Greenville Ave., Dallas, engr.

† **Mont., Great Falls**—AIRPORT IMPRVS.—B.A. 5/15—U. S. Eng., 19 E. Poplar St., Walla Walla, Wash., constr. airfield pavement, Great Falls Air Force Base, Eng. 45-164-51-3. CD 2/9.

† **New Mexico and Texas**—CONTROL BOARDS—B.A. 5/15—Bureau Reclamation, Dpt. Interior. Bldg. 1-A, Denver Federal Center, Denver, Colo., local control, supervisory control, telemetering, carrier-current and station-service equip. for Elephant Butte Power Plant, Las Cruces Switching Station and Albuquerque, Belen, Central, Las Cruces and Willard sub-stations, Rio Grande Proj. Inv. No. DS-3374. Extended date. CD 4/4.

† **Wyoming**—B.A. 5/10—U. S. Forest Service, Post Office Bldg., Denver, Colo.,

Albany Co.—R-2-265, Johnson Creek Bridge, Mountain Home Rd., No. 606. E. P. Cliff., regional forester.

† **Tex., Amarillo**—DORMITORIES—B.A. 5/14—U. S. Eng., Box 61, Tulsa 2, Okla., addnl. airmens dormitories facilities "A" at Amarillo Air Force Base, Inv. No. Eng 34-066-51-30. Approx. $500,000. CD 2/2.

† **Colorado**—SUB STATIONS—B.A. 5/15—Bureau Reclamation, Dpt. Interior. Fort Collins, construct addn. to Fort Morgan sub-station, Colorado-Big Thompson Proj. Spec. 704C-179.

† **Mont., Great Falls**—BARRACKS—B.A. 5/15—U. S. Eng., 19 E. Poplar St., Walla Walla, Wash., 7 barracks, 1 mess facilities bldg., appurtenant utilities, Great Falls Air Force Base, Eng. 45-164-51-2. Plans deposit $25. CD 3/14.

BIDS ASKED—BUILDINGS

▲ **Ark., Little Rock**—HOUSING—B.A. 5/8—Little Rock Housing Auth., 2800 Battery St., erecting 50 dwelling units in housing project, Ark 4-6. Plans deposit $50. Wittenberg, Delony & Davidson, Pyramid Bldg., Little Rock, archts. CD 5/17/50.

Tex., Spring Branch—SCHOOL—B.A. 5/7—Spring Branch Independent School Dist., J. E. Hartfield, pres., c/o C. H. Kiefner, archt., 3501 Buffalo Dr., Houston, Spring Branch Elementary school addn., Longpoint and Campbell Rds. Eugene Werlin, 3501 Buffalo Dr., Houston, assoc. archt. CD 3/22.

Tex., Houston—SCHOOL—B.A. 5/16—Houston Independent School Dist., 1600 Washington St., addns., alterations, repairs to River Oaks elementary school at San Felipe Rd. and Kirby Dr. Maddox & Johnson, 3501 Buffalo Dr., archts. CD 6/29.

Tex., Houston—MOTOR PARTS DEPOT, WAREHOUSE—Bids Asked—Motor Parts Dept. Inc., 1506 Caroline St., motor parts depot and warehouse. $200,000. CD 4/12.

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LOW BIDDERS—HEAVY CONSTRUCTION

▲ **M. E. Worrell & Worrell & Watkins,** Box 373, Longview, Tex., Low Bidder, **$1,393,534**, Hampton-Inwood bridge across Trinity River, DALLAS, TEX. Dallas county, Court House, Dallas, Tex. Koch & Fowler, 3900 Lemmon St., Dallas, Tex. engrs. CD 11/3/49.

Nord Sprinkler System Company, 1500 Dahlia St., Denver, Colo., Low Bidder, **$197,608**, est. $178,288 sprinkler system and landscaping 2,362 mi. between 52nd Acoma and 36 and Inca Sts., incl. approach from W. 48 Ave. on Valley Hy., Combined Colo. Projs. UI-002-2 (13) and U 004-1 (16), COLORADO State Hy. Dpt., 518 State Office Bldg., Denver, Colo. Bids Apr. 17. CD 4/10.

▲ **City and Denver Co.,** City and County Bldg., Denver, Colo., rejected bids Apr. 5, main arena, exhibition bldg., city auditorium imprvs., Unit 1, Schedule 4, L.B. **$1,304,763** general contract, DENVER, COLO. Will re-advertise. CD 4/13 under LB.

▲ **Hunter Constr. Co.,** Ada, Okla., Low bidder, **$461,857.** est. $498,200, 4.42 mi. roadbed, Contr. No. 2, **$458,856.** est. $474,479, 3.337 mi. roadbed, Contr. No. 3; **$405,355.** est. $423,158, 4.188 mi. roadbed, Contr. No. 6, at Luther; **$343,724.** est. $357,831, 3.787 mi. roadbed Contr. No. 7, at Luther; all foregoing Oklahoma Co. (Contractor will accept only one job) Boecking Const. Co., Bethany, Okla., **$58,809.** est. $55,514. 0.2 mi. bridges, Contr. No. 4, Oklahoma Co.

Stamey Const. Co., Altus, Okla., $458,866. est. $465,085, 4.42 mi. roadbed, Contr. No. 8, at Stroud, Lincoln Co.; R. R. Tway, Inc., 720 N.E. 19 St., Oklahoma City 5, Okla., **$56,097.** est. $52,849, 0.043 mi. bridges, Contr. No. 5 at Witcher, Oklahoma Co. OKLAHOMA. Oklahoma Turnpike Auth., Armory Bldg., Oklahoma City 5, Okla. Bids Apr. 24. CD 4/12.

▲† **J. M. Dellinger, Inc.,** Box 4227, Corpus Christi, Tex., **Texas Bitulithic Co.,** 111 Commerce, Dallas, Tex., and **Dean Word,** Box 330, New Braunfels, Tex. Low bidder, **$4,190,735,** runway constr. and reconstruction; **$585,000.** est. $225,000. construction of related services—North Field; addn. to storm drainage sys., clearing, fencing, grading, concrete and flexible pavement, Spec. No. 26959, Cont. NOY 24833. KINGSVILLE, TEX. U. S. Govt. Officer in Charge of Construction, Pub. Wks. Bldg. No. 19, Naval Air Station, Corpus Christi, Tex. Bids Apr. 23.

▲ **Cullum & Whittle Constr. Co.,** Great Natl. Life Bldg., Dallas, Tex., Contract Awarded, **$2,707,337,** sewage treatment plant. Cong. No. 360-B. DALLAS, TEX. City, City Hall, Main and Harwood St., Dallas, Tex. Bids April 3, Awarded April 19. CD 4/10. under LB.

CONTRACTS—BUILDINGS

▲ **Ambassador Apartments,** c/o Melvin Glick, vice pres., Glick Real Estate Co., 801 Chestnut St., St. Louis 1, Mo. Separate Contracts. **$1,500,000.** 12 story, bsmnt., 121 unit, brick, concrete, steel APARTMENT BLDG., 5340 Delmar Blvd., ST. LOUIS, MO. Wilmur Realty Co., operator. CD 4/13.

Taylor Building Co., 401 Jensen Dr., Houston, Tex., Owner builds. **$525,000.** 38 DWELLINGS, BELLAIRE, TEX. CD 2/27.

W. W. McMillan, 7948 Harrisburg St., Houston, Tex., Owner builds. Approx. **$390,000.** 39 DWELLINGS on Southtown St. HOUSTON, TEX. CD 2/20.

Suburban Homes Co., 9102 Humble Rd., Houston, Tex., Own forces. **$427,000.** 55 DWELLINGS, Sundown, Ellingham and Fawnridge Sts. HOUSTON, TEX. CD 3/1.

Lantana Park Development Co., Kingsville, Tex., Own forces. Approx. **$390,000.** 55 DWELLINGS, in Lantana Park area No. 2. KINGSVILLE, TEX. CD 2/26.

C. O. Beeler Riverside Development Co., 5047 Marietta St., Houston, Tex., Purchase and Hire **$368,000.** Proj. NO. 4, 50 DWELLINGS, PASADENA, TEX. CD 2/23.

Roden Constr. Co., 2826 Motor St., Fort Worth, Tex., Contract Awarded. **$802,000.** est. $944,000. 118 DWELLING units for total 31 one and two story bldgs., on concrete slab fdn., on fill, brick, haydite tile walls, utilities, Tex. 22-12 WICHITA FALLS, TEX. Wichita Falls Housing Auth., Wichita Falls, Tex., Bids April 19, Awarded April 21. CD 4/4.

Wallace & Koenig, 216 N. 19 St., Billings, Mont. Contract Awarded. $110,000. WAREHOUSE AND TERMINAL BLDG., BILLINGS, MONT. Salt Creek Freightways, Billings, Mont.

▲ **Olson Constr. Co.,** 323 Santa Fe Dr., Denver, Colo., Low Bidder, **$2,007,000,** general contract; Denver Plumbing and Heating Co., 1810 Blake St., Denver, Colo., **$620,000,** plumbing and heating, 3 story, brick, concrete. MANUAL TRAINING HIGH SCHOOL, DENVER, COLO. School Dist. No. 1, 414 14 St., Denver, Colo. Bids Apr. 18. CD 3/16.

† **Stull Constr. Co.,** 707 W. Orman Ave., Pueblo, Colo., Low Bidder, **$830,967,** misc. BUILDINGS (25-066-51-27) incl. remodeling 8 52x218 ft. existing bldgs. 60x120 ft. fire control, present bldg. addn., 60x100 ft. abrasive blasting bldg. PUEBLO, COLO. U. S. Eng., 1709 Jackson St., Omaha, Nebr. Bids Apr. 17. CD 4/5.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES

May 16—California
May 17—California
May 18—California

STREETS AND ROADS

May 16—California
May 17—California
May 23—California
May 25—California

† **Washington**—TRANSMISSION LINE—B.A. 5/10—Pub. Wks. Officer, 13 Naval Dist., 1611 W. Wheeler St., Seattle, circuits and equipment to raise transmission voltage for overhead line from Bangor to Keyport from 6.9 to 13.5 kv. Spec. 25499. Plans deposit $10.

† **Wash., Fort Lewis**—RAILROAD TRACKS—B. A. 5/10—Purch & Contg. Officer, Fort Lewis, rehabilitating Railroad tracks at Mt. Rainier Ordnance Depot, Inv. No. 51-169 CO 1/15, under Public Buildings.

Calif., Oakland—DRAINAGE SYSTEM EXTENS.—B.A. 5/14—Port of Oakland, foot of Grove St., extensions to drainage system, Oakland Municipal Airport. Plans deposit $10. CD 12/1/48.

† **California**—B.A. 5/15—Bureau Reclamation, Dpt. Interior Bldg. 1-A, Denver Federal Center, Denver, Colo., furnishing and del. f.o.b. cars at shipping point or f.o.b. cars at Lindsay, Calif., 2 traveling water screens, etc. for Traiger Pumping Plant, Lindsay-Strathmore Irrigation Dist., Friant-Kern Canal Distribution Systems, Central Valley Proj., Spec. DS-3395. L. N. McClellan, ch. engr.

† **Calif., Alameda**—SPRINKLER SYSTEM, etc.—B.A. 5/16—P. Wks. Office, Twelfth Naval Dist., Federal Office Bldg., Civic Center, San Francisco, Calif., sprinkler and fire alarm system water main extens., fire walls, Bldgs. Nos. 117 and 118 at U. S. Naval Air Station, Spec. 28380, NOY 26280. Plans deposit $10. CD 1/16.

California—TRAFFIC SIGNAL SYSTEM, etc.—B.A. 5/17—State Div. Hys., 120 S. Spring St., Los Angeles, traffic signal sys., traffic island, curbs, etc. on Magnolia, Central, Brockton, Jurupa Aves., in Riverside.

Calif., San Luis Obispo—B.A. 5/21—San Luis Obispo Co., Court House, grading, paving, Green Valley Rd., near Cambria.

Calif., San Francisco—B.A. 5/23—Dpt. P. Wks., City Hall, grading, drainage surf. Parker Ave. Plans deposit $10. CD 2/5/45.

† **Wash., Walla Walla**—B.A. 5/29—Veterans Admin., Munitions Bldg., Wash., D. C., sewage disposal connection for Veterans Admin. Hospital. Spec. 5162. Proj. 11-4026.

Ore., Corvallis—B.A. 5/21—City, City Hall, furnish, 8,800 ft. 20-in., 11,150 ft. 12 in. cement lined c.i. water pipe, V. L. Goodnight, City Hall, engr. CD 6/23/49.

BIDS ASKED—BUILDINGS

Calif., Sacramento—HEADQUARTERS—B.A. 5/15—State Div. Architecture, P. Wks. Bldg., Sacramento, headquarters bldg. for Dpt. Motor Vehicles. Extended date. Plans deposit $75. CD 4/11.

Calif., San Pedro—ARMORY—B.A. 5/15—State Div. Architecture, P. Wks. Bldg., Sacramento, constr. armory for Calif. National Guard. Plans deposit $25.

Calif., Sacramento—BUILDINGS—B.A. 5/14—Sacramento City Unified School Dist., 1619 N. St. construct 3 frame and stucco bldgs. at Sacramento Junior college. $320,000. Plans deposit $20. Harry J. Devine, 1012 J St., archt. CD 4/2/47.

Calif., Berkeley—SCHOOL—B.A. 5/17—Bd. Educ., Rose and Walnut Sts., Garfield Junior High School addns., alterations, $775,000. Plans deposit $25. Masten & Hurd, 526 Powell St., San Francisco, archts. Extended date. CD 4/24.

Calif., Cloverdale—SCHOOL—B.A. 5/17—Cloverdale Unified Elementary School Dist., Cloverdale, elementary school $300,000. Plans deposit $25. Ernest Frederick Winkler, 251 Post St., San Francisco, archt.

Calif., San Jose—MUSIC BLDG.—B.A. 5/22—Div. of Architecture, Pub. Wks. Bldg., Sacramento, general constr., electrical, plumbing, heating and ventilating for new music bldg. at San Jose State College. Plans deposit $75. CD 4/9.

▲ **Calif., Los Angeles**—JUVENILE HALL, etc.—B.A. 6-12—Bd. Supervs., Los Angeles Co., 501 Hall of Records, new juvenile hall, courts etc., $3,050,000. Kaufman & Stanton, 627 S. Carondelet St., and Austin, Field & Fry, 2311 W. 3 St., archts. both in Los Angeles, Calif. Plans deposit $100. CD 11/18/48.

† **Nev., Owyhee**—QUARTERS—B.A. 5/23—Bureau of Indian Affairs, Dpt. Interior, Interior Bldg., Wash., D. C., addns. to the existing school and construction of a quarters bldg., at the Western Shoshone Indian Agency.

† **Ore., Astoria**—BUILDINGS—B.A. 5/17—Pub. Wks. Officer, 13 Naval Dist., 1611 W. Wheeler St., Seattle, Wash., 25 duplex bldgs. at Tongue Point Naval Station, PHA Proj. N-33. $290,000. Plans deposit $15. D. Byers and H. B. Boland, designer, Builders Exchange Bldg., Portland, archts. CD 7/11/48.

SOON LETS CONTRACT—BUILDINGS

Wash., Cashmere—WAREHOUSE—Cashmere Pioneer Growers, Cashmere, soon lets contract 118x170 ft. insulated concrete warehouse for fruit storage. $85,000. Callender Engr. Co., Jones Bldg., Seattle, engrs. CD 2/24/50.

LOW BIDDERS—HEAVY CONSTRUCTION

McGuire & Hester, 796 66 Ave., Oakland, Calif., Low Bidder, $214,481, constr. storm sewers, sewer separation project Cedar St. System, BERKELEY, CALIF. City, City Hall, Berkeley, Calif. Bids Apr. 16. CD 4/3.

† **Jack Wilson**, 7111 Rio Flora Pl., Downey, Calif., Low Bidder, $274,975, est. $160,000, control tower at Edwards Air Force Base, MUROC, CALIF. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids Apr. 19.

McGuire & Hester, 796 66 Ave., Oakland, Calif., Low Bidder, $104,440, construct sanitary sewers on Fruitvale Ave., Elwood and E. 19 Sts., OAKLAND, CALIF. City, City Hall, Oakland, Calif. Bids April 17.

A. J. Raisch Paving Co., 900 W. Carlos St., San Jose, Calif., Low Bidder, $86,410, repaving, Almaden, Julian, San Fernando, 3 Taylor St., Johns, St. James San Salvador, 24 and San Pedro Sts., SAN JOSE, CALIF. City, City Hall, San Jose, Calif. Bids Apr. 16.

LOW BIDDERS—BUILDINGS

Riha Constr. Co., 4859 El Cajon Blvd., San Diego, Calif., Low Bidder, $569,559, est. $369,220, 1 story 36,000 sq. ft. frame, stucco Fletcher Hill SCHOOL, LA MESA-SPRING VALLEY, CALIF. La Mesa-Spring Valley School Dist., La Mesa, Calif. Bids Apr. 18. CD 3/27.

CONTRACTS—HEAVY CONSTRUCTION

Kuckenberg Constr. Co., 11104 N. E. Holman St., Portland, Ore. Contract Awarded, $661,190. 2.29 mi. rock toe enbankment, Columbia River Hy., F. A. Proj. FI 35 (3), Wasco and Hood River Counties, OREGON. State Hy. Comn., State Office Bldg., Salem, Ore. Awarded Apr. 19. CD 3/7 under L.B.

Porter W. Yett, 6500 N. E. Ainsworth St., Portland, Ore. Contract Awarded, $80,674, grading, paving 3 mi. on N. E. Glisan St., PORTLAND, ORE. Multnomah Co., Court House, Portland, Ore. Awarded Apr. 19. CD 4/11.

K. F. Jacobsen & Co., 0445 S. W. Porter St., Portland, Ore., Contract Awarded, $340,190. airport imprvs., ROSEBURG, ORE. City, City Hall, Roseburg, Ore. Bids Apr. 17. CD 3/27.

Whiting & Haymond, Springville, Utah, Contract Awarded, $133,273. est. $130,530, 2.532 mi. selected material base course road between Escalente and Henrieville, FASP No. S-254 (2), Garfield Co.***Young & Smith Const. Co., Beason Bldg., Salt Lake City, $200,932. est. $192,032. 3.944 mi. 2 in. road mixed bit. road surf. between Salina Canyon Summit and Freemont Junction, FAP No. F-199 (8), Sevier co. UTAH. State Road Comn., State Capitol, Salt Lake City, Utah. Bids April 18. CD 4/9.

† **Garmer, Abbott & Waldron**, Tremonton, Utah, Contract Awarded, $185,948. paving Granite Peak Rd., Dugway Proving Ground, incl. deepening roadside ditches, reconditioning base course and bit. roadway paving 26.5 mi. stretch. TOOELE, UTAH. U.-S. Eng., 74 New Montgomery St., San Francisco, Calif. Bids April 12. CD 4/3.

† **Manson Constr. and Eng. Co.**, 821 Alaskan Way, Seattle, 1, Wash., Contract Awarded, $40,032, est. $43,785, levee repairs on Ebey Island, Everett, Inv. No. 51-50. WASHINGTON. U. S. Eng., 4735 E. Marginal Way, Seattle, 4, Wash. Bids Apr. 20. CD 4/6.

Penn Constr. Co., 3393 N. Depot Ave., Baldwin Park, Calif., Contract Awarded, $74,681, 2½ m.g. reinf.-con. reservoir, ZARUSA, City Council, 213 Foothill Blvd., Azusa, Calif., Bids April 16. CD 4/11, under LB.

CONTRACTS—BUILDINGS

Structural Steel & Forge Co., 545 W. 7th South St., Salt Lake City, Utah, Own forces. Approx. $500,000. construct expans. program, incl. twin structural steel STORAGE bay and a department for the fabrication of steel roof decking and steel door frames. SALT LAKE CITY, UTAH.

Mead & O'Donnell, 7769 Melrose Ave., Los Angeles, Calif., Contract Awarded, $399,921, 24 frame, stucco CLASSROOMS for Los Angeles Valley Junior College, Van Nuys, LOS ANGELES, CALIF. Bd. Educ., 1425 S. San Pedro St., Los Angeles, Calif. Bids Apr. 11, awarded Apr. 18. CD 6/1/50.

▲ **Cunningham & Brittain, Inc.**, 5407 Village Rd., Long Beach, Calif., Owner builds, $1,697,820, 200 stucco DWELLINGS on Pageantry St., Pavo St., Lomika Ave., NORTH LONG BEACH, CALIF.

LOW BIDDERS—HEAVY CONSTRUCTION

▲ **Ball & Simpson**, 665 Delaware St., Berkeley, Calif., Low Bidder, $933,741, grading, surf., rein.-con., structural steel bridge 4.6 mi. between Isabella and Isabell Dam Site, Kern Co.***Madonna Constr. Co., P.O. Box 910, San Luis Obispo, Calif., $625,655, surf., grading 6. mi. between Templeton and Paso Robles, San Luis Obispo Co.***Rice Bros. Inc., P.O. Box 1489, Marysville, Calif., $224,273, surf. 8.4 mi. between Simmerly Slough and 8.4 mi. south of Butte Co. line, Yuba Co. CALIFORNIA State Div. Hys., Sacramento, Calif. Bids Apr. 18. CD 3/29.

▲ **Duncanson-Harrelson Co., & Stolte Inc.**, 530 W. Cutting Blvd., Richmond, Calif., Low Bidder, $1,631,057, bascule bridge across San Leandro bay between Bay Farm Island and Alameda, near Oakland, Alameda Co. CALIFORNIA State Div. Hys. P. Wks. Bldg., Sacramento, Calif. Bids Apr. 18. CD 3/22.

National Steel & Shipbuilding Corp., Harbor Dr. and 28 St., San Diego, Calif., Low Bidder, $305,174, est. $863,474 Schedule B, steel superstructure, **Guy F. Atkinson Co.**, 22233 S. Santa Fe Ave., Los Angeles, Calif., $424,306, Schedule A, substructure and deck, for Morena Blvd. Bridge, SAN DIEGO, CALIF. San Diego Flood Control Dist., Civic Center, San Diego, Calif. Bids Apr. 19. CD 3/27.

LOW BIDDERS—BUILDINGS

▲ **Farmer & Godfrey Constr. Co.**, N. 36 St., Phoenix, Ariz., Low Bidder, $2,014,098, 346-unit low-cost HOUSING UNITS, PHOENIX, ARIZ. Public Housing Auth., City Hall, Phoenix, Ariz. Bids Apr. 4. CD 3/9.

▲ **M & K Corp.**, Financial Center Bldg., San Francisco, Calif., Low Bidders, $2,138,000, general contract; M. Desiano, 1022 Buchanan St., San Francisco, Calif., $367,189, plumbing and mechanical work; Abrahm Lincoln High SCHOOL ADDNS.; alterations, SAN FRANCISCO, CALIF. Dpt. P. Wks., City Hall, San Francisco, Calif. Bids Apr. 18. CD 3/7.

CONTRACTS—BUILDINGS

▲ **Carrico & Gautier**, 365 Ocean Ave., San Francisco, Calif., Contract Awarded, $1,517,000, MUSIC and SPEECH bldg., San Francisco State College, SAN FRANCISCO, CALIF. State Div. Architecture, P. Wks. Bldg., Sacramento, Calif. Bids Apr. 3, awarded Apr. 20. CD 4/11, under LB.

CANADA

LOW BIDDERS—BUILDINGS

▲ **Max Crystall & Assocs.**, c/o Corona Hotel, Edmonton, Alta., rejected bids. 10 story, rein.-con. stone HOTEL at northeast corner of 102 Ave. and 100 St., L. B. Approx. $1,500,000. EDMONTON, ALTA. Postponed until building material supply situation clarifies. CD 12/16.

▲ **Max Crystall & Assocs.**, c/o Corona Hotel, Edmonton, Alta., rejected bids. 10 story rein.-con., stone HOTEL at northeast corner of 102 Ave. and 100 St., EDMONTON, ALTA. CD 12/16.

▲ **Dawson & Hall Ltd.**, 725 Clark Dr., Vancouver, B. C. Low Bidder, $1,894,600 250-bed New Galt HOSPITAL, LETHBRIDGE, ALTA. City, Lethbridge, Alta. Bids Mar. 30. CD 2/26.

CONTRACTS—BUILDINGS

▲ **B. C. Bridge & Dredging Co. Ltd.**, 544 Howe St., Vancouver, B. C. Contract Awarded. $40,000,000 Plant and equipment new pulp and newsprint MILL, DUNCAN BAY, B. C. Elk Falls Co. Ltd., Duncan Bay, B. C. Howard A. Simons, 16 E. Hastings St., Vancouver engr. Awarded Apr. 7. CD 8/17.

▲ **British Columbia Bridge & Dredging Co., Ltd.**, 544 Howe St. Vancouver, B. C. Contract Awarded. Approx. $5,000,000 PLANT AT PORT MELLON, B. C. Howe Sound Pulp Co. Ltd., 675 W. Hastings St., Vancouver, B. C. Sandwell & Co. Ltd., 1500 W. Georgia St., Vancouver, B. C., engrs. Awarded Apr. 10.

▲ **Stran Steel of Canada Ltd.**, 455 Spadina Ave., Toronto, Ont. Contract Awarded. Approx. $1,293,013. Constr., supply prefab buildings for various military bases in Canada, (installation by others) OTTAWA, ONT. Canadian Commercial Corp., 70 Lyon St., Ottawa, Ont.

ALASKA

LOW BIDDERS—HEAVY CONSTRUCTION

▲† **A. J. Hopper Co.**, Second and Cherry Bldg., Seattle 4, Wash. Low Bidder, $3,424,931 clearing, regrading, gravel surf. and drainage 57.6 mi. Richardson Hy., Sect. E, ALASKA. Alaska Road Comn., Juneau, Alaska. Bids April 19. CD 3/29.

▲† **Peter Kiewit Sons Co.**, 1300 Aloha St., Seattle, Wash., Low bidder, $5,513,000. est. $5,531,166, 20 type A and 22 Type C 8-family row type quarters, Inv. No. 545-507-51-71. Ladd Air Force Base, ALASKA, U. S. Eng., New Washington Hotel, Seattle 1, Wash. Bids April 20. CD 4/4.

† **J. H. Pomeroy & Co. Inc.**, 333 Montgomery St., San Francisco, Calif., Low Bidder, $541,000. est. $454,436, one each 120x220 ft. general warehouse at Ladd and Eielson Air Force Bases, Inv. No. 545-597-51-55. ALASKA. U. S. Eng., (APO 942, c/o PM, Seattle, Wash.) Anchorage, Alaska. Bids April 19. CD 3/28.

OFFICIAL PROPOSALS

Bids: June 15, 1951

Pump Stations

Mid-Valley Pipeline Company, Longview, Texas, will issue specifications and drawings May 15 and receive bids until June 15 covering building of six complete five thousand horsepower oil line pump stations and extending and adding to seven existing similar stations.

Contractors interested in receiving specifications and drawings contact D. J. Ward, Purchasing Agent, Longview, Texas, prior to May 10, 1951. Copies of drawings and specifications may be obtained by making a deposit of $25 which sum will be refunded upon returning. Good condition of the complete documents within ten days after receipt of same or if used in submitting a bonafide proposal.

Mid-Valley Pipeline Co.
D. J. Ward, Purchasing Agent
Bramlette Bldg., Longview, Texas

Bids: May 17, 1951

Seal Coating & Resurfacing Newark Airport

THE PORT OF NEW YORK AUTHORITY
CONTRACT O & M 127

Sealed proposal for Seal Coating and Resurfacing Certain Paved Areas, Roadways and Taxiways, at Newark Airport, Newark, N. J., will be received at the office of the Dept. of Purchase of The Port of New York Authority, Room 1402, 111-8th Ave., New York 11, until 11:00 A. M. (EDST) Thursday, May 17, 1951, at which time and place said proposals will be publicly opened and read.

Contract documents may be seen at the office of the Dept. of Purchase, and copies will be furnished upon deposit of $10 per set. Deposit must be delivered at the Treasury Dept., Room 1001, where you will be issued a receipt in duplicate. The deposit will be remitted if the documents are returned in good condition, not later than thirty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

Bids: May 15, 1951

Route and Bridge Construction

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

ROUTE 4 PARKWAY, SEC. 8B, BRIDGES, GRADING & PAVING:

Construction of Route 4 Parkway, Section 8B, from Route 28 to Galloping Hill Road, Bridges at Galloping Hill Road, Michigan Avenue, Rahway Valley Railroad and Market Street, and Incidental Grading & Paving, Borough of Kenilworth, Union County, Federal Project No. U-188(23). Length 0.339 mile.

Estimated:

	Roadway Items
30,400	cu. yds. Roadway Excavation—Earth
116,000	cu. yds. Borrow Excavation
21,500	cu. yds. Porous Fill
6,400	sq. yds. Waterbound Macadam
3,800	sq. yds. Penetration Macadam Surface
7,400	sq. yds. Rein. Conc. Pavement Surface, 10" thick
2,200	sq. yds. Plain Conc. Pavement Surface, 8" thick
	Bridge Items
16,639	cu. yds. Concrete in Structures
2,136,000	lbs. Structural Steel
966,000	lbs. Reinforcement Steel in Structures
17,400	lin. ft. Treated Timber Piles
9,570	lin. ft. Steel Bearing Piles
4,720	sq. ft. Random Ashlar Masonry

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 319, in the State Highway Office Building, 1035 Parkway Ave., Trenton, N. J., on Tuesday, May 15, 1951, at ten o'clock (10:00 A.M. EASTERN STANDARD TIME), eleven o'clock (11:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant & equipment with their bid.

NOTE: The proposed project is a "Federal Aid Project" authorized by the provisions of Title 27 of the Revised Statutes of New Jersey and supplements and by P. L. 646, 81st Congress, and is to be performed in accordance with the special provisions and requirements of the Bureau of Public Roads, Department of Commerce, as outlined in the specifications, which provisions require that labor be employed from lists furnished by the State Employment Service, 268 North Broad Street, Elizabeth, N. J. The attention of bidders is directed to the special provisions covering subletting or assigning the contract. The minimum wage paid to all common labor employed on this contract shall be $.75 per hour. The minimum wage paid to all intermediate grade of labor employed on this contract shall be $1.00 per hour. The minimum wage paid to all skilled labor employed on this contract shall be $1.50 per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: R. J. Abbott
State Highway Commissioner

Bids: August 20, 1951

Wadi Tharthar Works

IRAQ GOVERNMENT—DEVELOPMENT BOARD

1. Tenders are invited by the Development Board of the Government of Iraq for the construction of an Inlet Channel, a Protective Dyke on the left bank of the Channel, an Embankment for the Railway Diversion, and works in connection therewith in the vicinity of Samarra on the River Tigris.

The cube of excavation is approximately 35,000,000 cubic metres.

2. The Contract Documents and Instructions as to tendering may be inspected on and after the twenty-third day of April, 1951, at any of the following places, namely:

(a) The offices of the Development Board, Baghdad.
(b) The Iraqi Embassy, Washington, D. C., USA.
(c) The Royal Iraqi Legation, Paris.
(d) The offices of Messrs. Coode, Vaughan-Lee, Frank, and Gwyther, 9, Victoria Street, London, S.W.1, England.

3. Firms desiring to tender may obtain copies of the Contract Documents between the twenty-third day of April, 1951, and the fourth day of June, 1951, (both days inclusive), from either the Development Board, in Baghdad, or Messrs. Coode, Vaughan-Lee, Frank, & Gwyther, in London, upon payment of Fifteen Iraqi Dinars and after making a deposit of 5,000 Iraqi Dinars in cash at the Rafidain Bank, Baghdad or at its London Agents, The Midland Bank, Overseas Branch, 122, Old Broad Street, E.C.2. Copies of the Contract Documents will not be obtainable after the lapse of the period of six weeks from the date above mentioned. A further Deposit of twenty-five thousand Dinars will be payable on submission of tender, the said Deposit to be held as a guarantee of good faith of the tenderer. Full detailed conditions as to these Deposits may be ascertained from the "Instructions to Persons Tendering" attached to the Contract Documents. One Iraqi Dinar is equivalent to one pound Sterling.

4. Tenders must be submitted to the Development Board, Baghdad, and will be received up to noon on the twentieth day of August, 1951.

5. Particular attention is drawn to Article (21) of the "Instructions to Persons Tendering", namely, that tenders will only be accepted from firms of contractors who have previously executed works of a similar nature and magnitude.

Secretary-General
DEVELOPMENT BOARD
Baghdad, April 23, 1951.

U. S. Government

General Services Administration, Public Buildings Service, Washington, D. C. April 24, 1951—Sealed bids in duplicate for tunnel piping, etc., at the boiler plant and incinerator building at the National Institutes of Health, Bethesda, Maryland will be received until 1:00 P.M. Standard Time, on May 22, 1951, in Room No. G-341-B, General Services Building, Washington, D. C., and then publicly opened in Room No. G-341-D. Bid guarantee is required. If the amount of the contract exceeds $2000, U. S. Standard Form No. 23, Construction Contract, will be used and performance and payment bonds will be required. Upon request one set of Prebid Documents and two sets of drawings and specifications will be supplied without charge to each general contractor interested in bidding on the complete project, all of which must be returned. Not more than six additional sets of drawings and specifications may be obtained by general contractors at a charge of $5.00 per set, which will be refunded for each set returned in good condition within 15 days after the bids are opened. Checks offered as payment must be made payable to the order of the Treasurer, U. S. Upon request and in the discretion of the undersigned one set of drawings and specifications will be furnished to builders' exchanges, chambers of commerce and other similar organizations, with the understanding that the set will be retained on their premises and made available for inspection by any interested sub-contractor or material firm. Bidding material may be obtained at Room No. 1304 General Services Building, 19th and F Streets, N. W., Washington 25, D. C. Phone EXecutive 4600, Extension 2397. W. E. Reynolds, Commissioner of Public Buildings Service, General Services Administration.

Department of Commerce, Bureau of Public Roads, April 16, 1951. SEALED BIDS will be received at the office of the Division Engineer, Bureau of Public Roads, 1440 Columbia Pike, Arlington, Virginia, until 11:00 A.M., E.S.T., May 18, 1951, for Project 1E3, Baltimore-Washington Parkway, Prince Georges County, Maryland. Reinforced Concrete Structure with Stone Facing over East-West Highway and Approaches. Length 0.152 mile. The approximate quantities of the more important items are as follows: 52,500 cu. yd. Excavation, 1,912 cu. yd. Cement Concrete, 310,700 lb. Reinforcing Steel and 191 cu. yd. Stone Masonry. Minimum wage rates have been fixed as required by law. For plans and specifications, a deposit of $10.00 cash or CERTIFIED check made payable to the Treasurer of the United States, will be required to insure their return within 15 days after the opening of bids. Plans, specifications and proposal forms may be obtained at the address given above. H. J. Spelman, Division Engineer.

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-3389) will be received by the Bureau of Reclamation, Denver, Colorado, until May 17, 1951, and then publicly opened for furnishing four 50-foot by 30-foot radial gates and one lot of embedded metalwork for Cachuma Project, California. Delivery is desired within 365 days. For particulars, address Bureau of Reclamation, Building 1-A, Denver Federal Center, Denver, Colorado.

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-3392) will be received by the Bureau of Reclamation, Denver, Colorado, until May 17, 1951, and then publicly opened for furnishing single-circuit steel towers for Bismarck-Mobridge-Oahe 230-kilovolt transmission lines, Garrison Dam approach spans and ties to switchyards between Oahe and Sioux City for Transmission Division, North Dakota-South Dakota, Missouri River Basin Project. Delivery is desired within 600 days. For particulars, address Bureau of Reclamation, Building 1-A, Denver Federal Center, Denver, Colorado.

(Continued on page 96)

OFFICIAL PROPOSALS
(Continued from page 95)

Bids: May 16, 1951

State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, and special provisions for projects financed with federal aid funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nineshirty o'clock A.M., eastern standard time on Wednesday, May 16, 1951, by Henry A. Cohen, Director, Bureau of Contracts & Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects: Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts & Accounts, Albany, N. Y., and at the office of the District Engineers noted below, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for plans and proposal forms for each contract is indicated below. A refund will be made in full to bidders for the return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
		DISTRICT No. 2				
		L. Ketchum, Dist. Engr., 109 No. Genesee Street, Utica, N. Y.				
Oneida	FAC 51-2	Rome-West Artery W. Whitesboro St.-Black River Blvd.-FAC 50-9 Proj. U-635-3) Cont. 2	0.72	Traffic Control System	$1,900 Plans $10	$33,000
		DISTRICT No. 4				
		A. R. Mullikin, Dist. Engr., Barge Canal Terminal, Rochester, N. Y.				
Ontario	FAC 51-3	Geneva City Lake Front Arterial, Pt. 1 Proj. U-452-5	0.62	Grad. & Drs. = 0.55 mi.; 9" Cem. Conc. Pavt. 38' Wide = 0.06 mi.; Asph. Conc. Tr. 1A, Out. = 0.01 mi.; North & South Ramps = 0.24 mi.	$45,000 Plans $15	$822,000
Ontario and Monroe	OT 51-2 OT 51-3P RC 51-14 ST 51-2	Ontario Thruway, Sec. J & 9 83 Sec. 9A Clover Street, S. H. 294 Mendon-Ionidord, S. H. 493 Five secondary Roads		9" Cem. Conc. Pavt. 2 at 25' Wide = 7.73 mi.; Asph. Conc. Tr. 1A, Opt. = 1.67 mi. Run of Bank Gravel = 0.35 mi. Misc. Work = 0.08 mi. 4 Sp. Hy. Sep. Alpha I-Beam 255' Tot. 3 Sp. Hy. Sep. Alpha I-Beam 136' 3" Tot. 2 Sp. Hy. Sep. Conc. Rig. Fr. 162' Tot. 2 Sp. Hy. Sep. Conc. Rig. Fr. 183' 3" Tot. Alpha Royalty = $861.00	$220,000 Plans $100	$3,930,000
		DISTRICT No. 5				
		C. R. Watson, Dist. Engr., 65 Court Street, Buffalo, N. Y.				
Erie	FARC 51-9 FAC 51-4	Lackawanna City, South, S. H. 507 Hamburg Turnpike, FAC 49-10 Proj. U-750-3) Cont. 3	2.39	Traffic Signal System	$4,000 Plans $10	$75,000
		DISTRICT No. 6				
		H. E. Brecke, Dist. Engr., 20 West Main Street, Hornell, N. Y.				
Tioga	FASS 51-14	West Creek Road - Smullin 0.50 Bridge Co. Rd. 308-408 Proj. S-261-2		Asp. Conc. Tr. 1A, Opt. 2 Sp. Alpha I-Beam 72' Ea. Alpha Royalty = $151.80	$9,500 Plans $10	$178,000
Chemung	FASS 51-10	Chemung-Van Etten-Lomuis 0.28 Bridge Co. Rd. 3 Proj. S-86-2		Asph. Conc. Tr. 1A, Opt. 2 Sp. Alpha I-Beam 68' 9" Ea. Alpha Royalty = $115.20	$10,000 Plans $10	$189,000
		DISTRICT No. 10				
		J. J. Dacey, Dist. Engr., Montauk Highway at Little E. Neck Road, Babylon, L. I., N. Y.				
Bronx	FABRP 51-1	Bronx River Parkway No. 9 Exc. (Bruckner Blvd. Interchange) Proj. U-979-9)	0.27	8" & 6" Col. Cem. Conc. 2 at 34' Wide - 3 Sp. Conc. Rig. Frame 1 at 81', 2 at 47' 3"	$5,000	$1,535,000

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of "State of New York, Commissioner of Taxation & Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders".

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

H. D. TALLAMY
Supt. of Public Works

Bids: May 15, 1951

Bridge Construction

COUNTY OF CORTLAND, NEW YORK

Pursuant to the provisions of the Highway Law and in accordance with a resolution of the Board of Supervisors dated April 5, 1950. The Highway Committee of said Board will receive sealed proposals until 2:00 P.M., May 15, 1951 at the office of the Board of Supervisors, Court House, Cortland, N. Y., for the following project:

SOUTH STREET BRIDGE
VILLAGE OF McGRAW
T.W.P.C. PROJECT No. 2905

Maps, plans and specifications and proposal forms may be seen at the office of the County Superintendent of Highways, Court House, Cortland, New York. The deposit for plans and proposal forms required is ten dollars ($10.00). A refund will be made in full to bidders for return of plans within 30 days of award or rejection of bids.

Proposal for the contract must be submitted in a sealed envelope and accompanied by draft or certified check payable to the order of "Treasurer, Cortland County" for the sum of Three Thousand Five Hundred Dollars ($3,500.00). The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law as set forth in "Instructions to Bidders".

The right is reserved to reject any or all bids.

William J. Dwyer
County Superintendent of Highways

Bids: May 14, 1951

Water and Sewer Pipe

Sealed bids will be received by the Department of Public Works at the office of the Department in the City Hall, Hudson, New York, until 10:00 A.M., May 14, 1951, on any or all of the following items:

Approximately one thousand linear feet of 8 inch Cast Iron Bell and Spigot, cement lined water pipe, Class 150, conforming with A. S. A. Specifications A 21.2 latest edition and A 21.4 latest edition.

Approximately 1000 linear feet of 8 inch and 600 linear feet of 12 inch extra strength clay sewer pipe conforming to A. S. T. M. Specification C 200-47 latest edition.

Approximately one thousand linear feet of 8 inch asbestos cement water pipe with couplings, Class 150, conforming with U. S. Treasury Department Spec. #363.

Bids must be enclosed in a plain sealed envelope bearing the following marking and no other, "BID FOR PIPE".

The Department of Public Works reserves the right to reject any or all bids.

DEPARTMENT OF PUBLIC WORKS
Commissioner Edwin J. Folz
City Hall, Hudson, New York

OFFICIAL PROPOSALS

Bids: May 15, 1951

Construction of Viaduct

STATE OF NEW JERSEY
STATE HWY. DEPT., TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

CRANFORD VIADUCT, ROUTE 4
PARKWAY, SECTION 7

Construction of Viaduct over South Avenue, Staten Island Rapid Transit Railway, C.R.R. of N. J., and North Avenue on Route 4 Parkway, Section 7, in Cranford Township, Union County, Federal Aid Project No. E-158(22). The contract includes the construction of the substructure of the viaduct consisting of two abutments and seven piers, all of reinforced concrete. The principal items of construction are: Estimated:

4,812 cu. yds. Concrete in Structures
174,395 lbs. Reinf. Steel in Structures
4,425 lin. ft. Steel Piles

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Tuesday, May 15, 1951, at ten o'clock (10:00 A.M.—EASTERN STANDARD TIME), eleven o'clock (11:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the prequalification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

NOTE: The proposed project is a "Federal Aid Project" authorized by the provisions of Title 23 of the Revised Statutes of New Jersey and supplements, and by P. L. 646, 81st Congress, and is to be performed in accordance with the special provisions and requirements of the Bureau of Public Roads, Department of Commerce, as outlined in the specifications, which provisions require that labor be employed from lists furnished by the State Employment Service, 268 North Broad Street, Elizabeth, N. J. The attention of bidders is directed to the special provisions covering subletting or assigning the contract. The minimum wage paid to all common labor employed on this contract shall be $1.75 per hour. The minimum wage paid to all intermediate grade of labor employed on this contract shall be $1.00 per hour. The minimum wage paid to all skilled labor employed on this contract shall be $2.50 per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: R. J. Abbott
State Highway Commissioner

Bids: May 23, 1951

Sewage Treatment Plant

Sealed bids will be received by the Palisades Interstate Park Commission until 3:00 P.M., E. D. S. T., May 23, 1951, for the construction of a sewage treatment plant for 10,000 population and a 200,000 gallon concrete reservoir in the Anthony Wayne Area (Queensboro), Harriman State Park, Orange County, New York.

Full information, plans, specifications and proposals may be secured at Administration Headquarters, Palisades Interstate Park Commission, Bear Mountain, N. Y. Payment for plans is Five Dollars ($5.00).

THE COMMISSION RESERVES THE RIGHT TO REJECT ANY OR ALL BIDS RECEIVED.

OFFICIAL PROPOSALS
(Continued from page 96)

Bids: May 15, 1951

Airlines Terminal & Parking Garage

TRIBOROUGH BRIDGE AND TUNNEL AUTHORITY

SEALED BIDS WILL BE RECEIVED BY the Triborough Bridge and Tunnel Authority's Administration Building, Randall's Island, New York 35, N. Y., as follows:

Until 11:00 a.m. daylight saving time, on TUESDAY, MAY 15, 1951

For the construction of East Side Airlines Terminal and Public Parking Garage located 37th to 38th Streets and First Avenue, Borough of Manhattan.

Deposit required for specifications, etc., $75 for each set.

The information for bidders, form of contractor's bid, form of contract, the specifications, the plans and the forms of performance and labor and material bonds may be examined at the office of the Architect, John B. Peterkin, 26 West 44 Street, New York, N. Y. and copies thereof may be obtained upon deposit for each set, of the amount hereinabove specified, to be refunded upon return of the plans and documents in good condition within 30 days after the opening of bids.

Bids: May 15, 1951

Route Construction

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

ROUTE 4 PARKWAY, SECTION 9D
Construction of Route 4 (Parkway), Section 9D, from Galloping Hill Road to Coakley Drive, Service Road, Parking Area and Retaining Wall, Borough of Kenelworth and Township of Union, Union County. Length 0.464 miles.

ROADWAY ITEMS

Estimated:
2,493 cu. yds. Roadway Excavation-Earth
29,293 sq. yds. Topsoiling
17,446 sq. yds. Macadam Base
11,577 sq. yds. Penetration Macadam Surface
440 tons Bituminous Concrete Surface
Retaining Wall Items
474 cu. yds. Concrete in Structures
10,700 lbs. Reinforcement Steel in Structures

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J., on Tuesday, May 15, 1951, at ten o'clock (10:00 A. M. EASTERN STANDARD TIME), eleven o'clock (11:00 A. M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: R. J. Abbott
State Highway Commissioner

SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT: BUSINESS: **"OPPORTUNITIES"** :EQUIPMENT :USED OR RESALE

ENGINEERS

ELECTRICAL - MECHANICAL - STRUCTURAL

Openings in Ohio and New York offices offering long term employment with good salary for qualified Group Leaders, Designers and Draftsmen experienced in one or more of the following phases of industrial plant design:

Electrical Power, lighting layouts and electrical controls.

Mechanical Plant layout, process piping, conveyors, heating and ventilation, boiler houses, process equipment layout, refrigeration, plumbing, tanks and vessels, packaging equipment, special machinery and equipment.

Structural Structural steel and reinforced concrete.

Please submit complete resume stating experience, education, salary required and availability date.

THE H. K. FERGUSON COMPANY
Engineers and Builders

The Ferguson Bldg. 1783 E. 11th St.
Cleveland 14, Ohio

19 Rector Street
New York 6, N. Y.

ELECTRICAL ENGINEER

Graduate, with five to ten years experience in design of steam and hydro-electric power plants and high voltage substations. Excellent opportunity with large consulting firm in New York for Engineer with satisfactory qualifications. Please send resume of experience and summary of personal data to

P-9633, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

DESIGNERS and DRAFTSMEN
for
STRUCTURES and HIGHWAYS

Permanent Positions

RICHARDSON and GORDON
1411 Walnut Street,
Philadelphia 2, Pa.

WANTED
ENGINEERS
. . . to train as . . .
Industrial Consultants in Fire Protection Engineering

full pay to start—complete training field engineering with top U. S. and Canadian industry—usual pension and other benefits. Permanent.

Write complete qualifications to

P-9609, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

CONSTRUCTION SUPERINTENDENT

Nationally known mechanical contractors. Need experienced superintendent for equipment and piping installation. Several locations soon available within continental United States. Please state experience.

P-9561, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

First Class SUP'T WANTED

On large flood control State contract in central N. J. Work involves cofferdaming; concrete structures, including chamber water diversions, pipe work and fill. Must have had successful experience on comparable work. State availability, experience, references and salary.

P-9516, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (18)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

CIVIL SERVICE

STRUCTURAL DESIGNER, Graduate Civil Engineer with at least five years experience in structural steel and reinforced concrete design. Experience on locks, dams and drainage structures desirable but not essential. Pleasant working and living conditions in city of 124,000 population. Salary open. Give full particulars, photo and references. Byron P. Lyons, Chief Engineer, Louisiana Department of Public Works, 11th Floor Capitol Building, Baton Rouge, Louisiana.

POSITIONS VACANT

DRAFTSMEN—STRUCTURAL Steel Detailers experienced only. Alliance Engineering Co., 82 W. Washington St., Chicago, CE-6-2819.

ENGINEER—CIVIL. Experienced on heavy construction and earth moving projects. Drafting, estimating, surveying and field supervision. Must be first-class man. Work located near Miami, Florida. P-9628, Engineering News-Record.

MECHANIC, AT once. For heavy construction equipment. Must be steady worker Permanent position. P-9629, Engineering News-Record.

CIVIL ENGINEERING Technicians: Laboratory and field men experienced in soils, concrete and asphalt. Drillers: Soil borings and diamond drilling; locations, East, Midwest and South. Furnish complete information including age, education, experience. Toledo Testing Laboratory, Toledo, Ohio.

ENGINEER CE, experienced in heavy construction, excavation, sewers, water, roads and estimating. State age, education, engineering experience. Box 416, Scarsdale, N. Y.

(Continued on page 98)

Additional Position Vacant Advertising on pages 98 & 99

CONSTRUCTION SUPERINTENDENT

Experienced in construction of Blast Furnaces. Must be a good organizer, able to handle labor and qualified to exercise executive ability. Compensation commensurate with ability of individual.

Write and furnish full information regarding education, training, chronological details of experience, age, salary expected, etc. All replies will be considered strictly confidential.

P-9382, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

CORROSION ENGINEERS

Wanted by large consulting firm—Corrosion Engineers with minimum of four years experience in corrosion investigations and design of cathodic protection on pipe lines and lead cables in country and city networks. Must be graduate electrical engineer (or equivalent). Work involves extensive travel. Only applicants with above qualifications will be considered. Give full details of education and experience, and references in application.

P-9617, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

ROCK PRODUCTS has opening on its Editorial Staff

For a man interested in editorial work who is free to travel extensively throughout the country visiting plants in nonmetallic minerals industries for the purpose of writing technical articles.

Applicant must have aptitude and desire to write. Engineering education or background in the industry is preferred.

Working knowledge of industry production problems to be gained by personal inspection and study of plant operations.

Address Replies to

Bror Nordberg, *Editor*
309 W. Jackson Blvd., Chicago 6, Illinois
Teleph. Harrison 7-7890

WANTED

SALESMEN

To Sell heavy construction equipment in the New York area. Salary, Commission, Expenses. Engineering or sales background preferred. Ages between 25 and 35 years. Reply by mail or call extension 11 for an appointment.

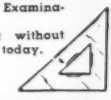
JAEGER-LEMBO MACHINE CORP.
Northern Blvd. & 127th St.
Box 128 Flushing, New York
Phone: Newtown 9-7777

STRUCTURAL ENGINEERING

A Course of Instruction by Mail

FOR FORTY YEARS our courses have helped thousands to better positions and to pass State Board Examinations.

Information sent without obligation. Write today.



WILSON ENGINEERING CORP.
College House Offices - Dept. E.
Harvard Sq. Cambridge, Mass.

POSITION WANTED
(Continued from page 97)

CIVIL ENGINEER one to two years field layout experience desired. Must be able to read plans and take off quantities. This is an opportunity to connect with a progressive and growing concern. Give full details concerning age, education and experience in letter. Location usually in Eastern States. P-9657, Engineering News-Record.

BRIDGE DESIGNERS and Draftsmen, good pay for qualified men. Opportunities for advancement. Pleasant working conditions. Interesting projects. Write stating education and experience or apply in person. D. B. Steinman, Consulting Engineer, 117 Liberty St., New York 6, N. Y.

SUPERINTENDENT, HEAVY on concrete, Four Overpasses. Baltimore vicinity. P-9656, Engineering News-Record.

SELLING OPPORTUNITIES OFFERED

SALES ENGINEER with proven record selling engineering-construction services to industrial and and process industries. Headquarters Atlanta, Ga., territory unlimited. Write fully SW-9644, Engineering News-Record.

SALES ENGINEER to work out of Atlanta covering Southeast selling architect-engineer services for schools, hospitals, office buildings, water & sewer projects. Sales experience not absolutely necessary. Must show in record responsible charge of architect-engineer work. Write fully SW-9645, Engineering News-Record.

EMPLOYMENT SERVICE

SALARIED PERSONNEL, $3,000-$25,000. This confidential service established 1920, is geared to needs of high grade men who seek a change of connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. Jira Thayer Jennings, Dept. L, 241 Orange St., New Haven.

POSITIONS WANTED

DIVER-FRANK Hefling, formerly Chicago, San Francisco, U.S. & foreign work. Passport. Capable of deep water, 17 yrs. const., salvage, surveys, special jobs outfitted. Record underwater torch. Improved telephone equipped gear, safety power compressor, single unit lifeline. Experienced designer air lift dredging, dewatering. Miami, Florida, 268 S.W. 8th St., Phone 3-8089.

MAINTENANCE AND Construction of Streets and Sewers. Superintendent with 30 years experience, half of which with Municipal and public works. Streets—Sewers—Equipment—Shop. Have succeeded in reducing Maintenance Costs more than 50 percent. Will be available on permanent or consulting basis June 1st. Reply PW-9460, Engineering News-Record.

CIVIL ENGINEER, single, arrived from Europe 1950, former university professor of Civ. Engrings; 48 years experience in harbor and highway structures, seeks any position with consulting engineers or contractors. Jonas Simoliunas, 1426 Junction Ave., Racine, Wis.

CONSTRUCTION ENGINEER, C. E. Graduate, 14 years experience in surveying and heavy construction. Foreign or territorial employment acceptable. Salary $8,500 per year. PW-9528, Engineering News-Record.

BUILDING CONSTRUCTION Superintendent or General Superintendent 45 years experience. Thoroughly familiar with all types of Building Construction. References, E. Harold Bowen, 3450 NW 79th Street, Miami 38, Florida.

CONSTRUCTION EXECUTIVE, 50. Capable of managing an entire business. Thoroughly experienced with buildings, machinery installation, process piping and heavy construction projects. Actual superintendent and project manager background on large jobs. PW-9580, Engineering News-Record.

AVAILABLE

MECHANICAL ENGINEER

Over 25 years broad experience design of heavy industrial projects, consisting principally of steam-electric power plants, iron and steel plants, oil refineries and process plants. Capable of supervising complete project design. Specialist in high temperature and pressure piping. Now employed as project engineer seeks responsible position.

PW-9311, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

WORK WANTED STRUCTURAL DESIGN

Graduate Civil Engineer, Licensed, 20 years experience in design of all types of steel and reinforced concrete buildings and hangars will accept design contracts—location New York City.

PW-9478, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

AVAILABLE AT ONCE

PROJECT ENGINEER

Age 41 — 17 Years Construction Experience on Airports, Highways, Industrial & Commercial Buildings, Sewage Disposal Plants, Heavy Excavation & Plant Equipment Installation. Top Estimator with Experience in Cost & Progress Control, Budget Preparation, Program Planning, Sub Contract Negotiation & Project Supervision.

PW-9640, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

POSITIONS WANTED

REGISTERED ENGINEER, experienced, Master's Degree, desires position in hydraulic-hydrologic field. Eastern states or foreign. PW-9575, Engineering News-Record.

BUSINESS OPPORTUNITY

Contractors:

I am interested in financial and active participation in a small construction company. My background: construction, engineering, degree Mass. Inst. of Technology, and business. Reply BO-9489, Engineering News-Record.

SPECIAL SERVICE

Right of Way.

Clearing Wanted. By Contract. Will furnish men and equipment. Joe Rafick, Box 186, James City, Pa.

PATENT ATTORNEYS

Patent Practice

before U. S. Patent Office • Validity and infringement investigations and opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommel, Registered Patent Attorneys, Suite 434, 815 15th Street, N. W., Washington 5, D. C.

-Consult: Z. H. Polachek

Reg. Patent Attorney, 1234 Broadway, New York 1, N. Y.

WASHED SAND-GRAVEL

READY-MIX CONCRETE

CENTRAL N. Y. STATE

Sand & gravel sales average $85,000 yrly. Ready-mix sales at rate of $250,000 yrly. Two (2) modern, completely equipped plants in continuous profitable operation for 25 yrs. in same family. Stable business volume. Extremely low cost per ton of production. Products approved by state of N. Y. Proposition includes old-est. going business embracing 12 acres of sand & gravel glacial deposits, all equipment & machinery, stock piles valued at $25,000, modern garage, office bldg., etc. Full price $150,000; ½ cash necessary.

DAVID JARET CO.
Established Over 28 Years
150 Montague Street Brooklyn 2, N. Y.
ULster 2-5600

ESTIMATING SERVICE

Any Trade and Type of Project

Literature and Sample on request

Construction Survey Cooperative
101 Park Ave., New York 17, N. Y.
MUrray Hill 5-7317 Founded 1922

WANTED

Large engineering firm wishes to acquire several complete plants through purchase of (1) capital stock, (2) assets, (3) machinery and equipment, whole or in part. Personnel retained where possible, strictest confidence.

Box 1206
1474 Broadway New York 18, N. Y.

CONSTRUCTION SUPERINTENDENT

Experienced in construction of Open Hearth Plants. Must be a good organizer, able to handle labor and qualified to exercise executive ability. Compensation commensurate with ability of individual.

Write and furnish full information regarding education, training, chronological details of experience, age, salary expected, etc. All replies will be considered strictly confidential.

P-9381, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

Materials Engineer and Soils Engineer

For construction work in eastern section of the United States. Duration of work 6 to 8 months. Requirements: Materials Engineer—Field testing and control of materials of construction and concrete mix design. Soils Engineer—Soil surveys, identification testing (field and laboratory) compaction control and stabilization. In reply give brief resume of experience.

P-9537, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

WANTED

Construction Superintendent

Graduate Engineer: 15 years field experience; experienced in: Estimating; Use, capabilities and limitations of heavy equipment; Heavy earth and rock excavation; Sewers, water lines and comparable installations; Road construction, asphalt penetration, asphaltic concrete and concrete; Culvert and bridge construction. Must submit unquestionable references over past 10 years' performance. Remuneration for right man, at least $15,000 per year. No Second-Raters. Location: Western New York State

A. & J. BUYERS, INC.
3580 Sheridan Drive Buffalo 21, N. Y.

SANITARY ENGINEERS
DESIGNERS DRAFTSMEN

Experienced men wanted by Consulting Engineers Office—State qualifications age experience salary and date available in first letter. Replies held strictly confidential.

P-9485, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

WANTED
BRIDGE DESIGNERS
DESIGNER DRAFTSMEN
RESIDENT HIGHWAY ENGINEERS

Experienced men wanted. State qualifications, age, salary and date available in first letter. Location, Western Pennsylvania.

P-9592, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

CITY OF DETROIT

Engineers experienced in the design and construction of water works needed for $38,000,000 project. Starting salary $4,382, $5,204, $5,736, $6,586 per year with annual increases. Submit resume of experience with application request.

DETROIT CIVIL SERVICE COMMISSION
1501 Water Board Building
735 Randolph Street, Detroit 26, Michigan

DESIGNERS

We pay among the highest rates in the industry
Our employees share annually in company profits

Must be willing to relocate in Cleveland
Permanent employment
Our continuous expansion and growth offers many fine future opportunities.
We need Designers experienced in Blast Furnace, Steel Mill or Oil Refinery Design.
Men with specific experience, training and background in the following classifications:

STRUCTURAL DESIGNERS
CONCRETE DESIGNERS
ELECTRICAL DESIGNERS
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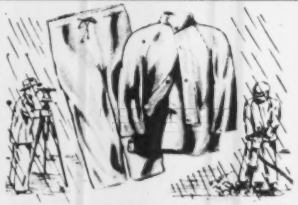

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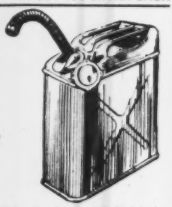

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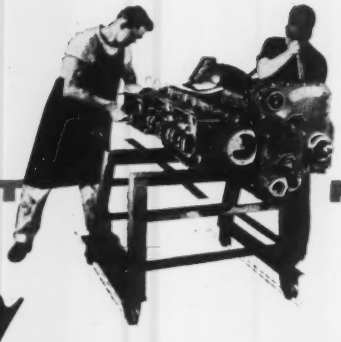

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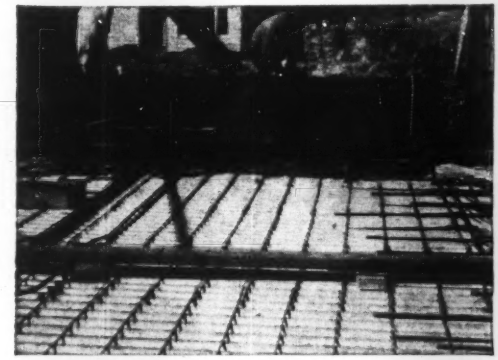
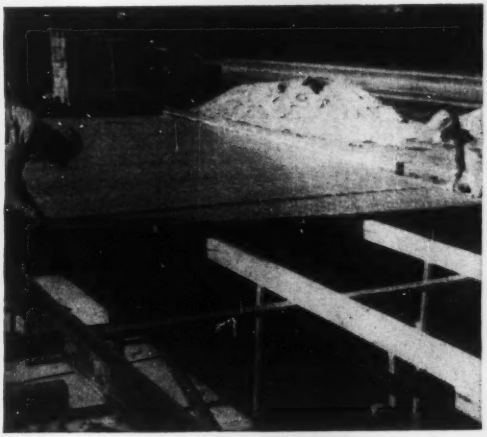




Combination form and reinforcement for slabs to 14 ft

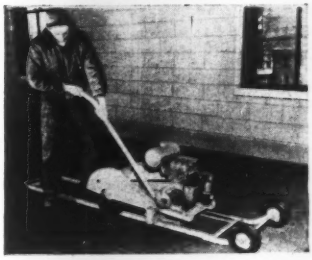
Cofar floors combine deep-corrugated high-strength galvanized steel and transverse welded reinforcement. The positive moment reinforcing at the bottom of the concrete floors consists of deep corrugated galvanized steel. This sheet eliminates the need for forms. Transverse wires (welded in manufacture) across the corrugations provide mechanical bond between the concrete and steel and serve as temperature reinforcing. In addition, zinc of the galvanizing and the concrete unite to give a chemical bond. The Cofar sheets are supported on and fastened to the main structural framing members. Structural framing members may be masonry walls, concrete, or steel. Cofar is manufactured in lengths to 14 ft, standard covering widths of about 32 in., thickness from 18 to 24 gage. With ½ in. deep corrugation, nominal width is 2⅞ in.; with 1¼ in. corrugations, 1¼ in.—Granco Steel Products Co., Subs. Granite City Steel Co., Granite City, Ill.

Truck for concrete mixer

M-10 truck has been engineered and designed exclusively to carry a concrete mixer. It has a 169-in. wheelbase and weighs 11,680 lb. Weight-distribution system is said to permit the short wheelbase. Illustration is of the M-10 equipped with a 6½-yd Challenge mixer that weighs 7,120 lb and has a drum volume of 313 ft.—Cook Bros. Equipment Co., 1815 N. Broadway, Los Angeles 31, Calif.

Grooved pipe fittings

Malleable fittings for grooved pipe include L's, T's, adapter nipples, crosses, laterals, bull plugs, and reducers. Gruvagrip fittings come in sizes from ¾ to 12 in., and will withstand the same working pressures as Gruvagrip couplings. Inside walls are true circles, and they are smooth and gently curved to prevent turbulence and frictional losses. Each fittings has a permanent identification mark.—Gustin-Bacon Mfg. Co., 1412 W. 12th St., Kansas City, Mo.



Concrete cutting saw

Gasoline-power concrete saw features guide rails to eliminate blade breakage caused by side-to-side wobble or the application of off-center pressure. The Creeper is equipped with a simple water-hose attachment for use with diamond or specially bonded abrasive blades where dust suppression is required.—Martin Fireproofing Corp., Dept EN, 2200 Military Road, Buffalo 17, N. Y.

Bucket for lift trucks

Bucket accessory for handling bulk materials is available for all Hi-Duty lift trucks. The bucket has a 9-ft capacity, and features flared sides and lip to facilitate clean-up along walls and into corners. Bucket action is controlled by hydraulically actuated cylinders. The bucket can be opened or closed at any height up to 7 ft 10 in. on a 9-ft mast. Bucket opens and closes through a full 90-deg arc.—Transitier Truck Co., 2477 N. W., 23rd Ave., Portland, Ore.

Sewer root destroyer

Concentrated compound of crystals and fine powders is said to provide an

(*Continued on page 111*)

Save Men...Money...Material *with* Concrete Joist Construction

In these days of critical shortages—when men and money and material must be used to the very fullest, there is one method of building that truly meets the need on every count—it's Ceco's Meyer steelform construction. For here is a building way that saves as it serves:

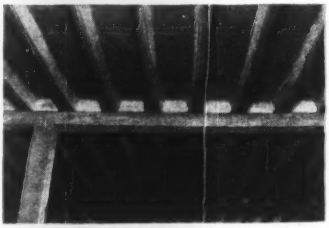
Saves men because less time and labor are required in providing open wood centering and form work.

Saves money because less concrete is used . . . the dead load is kept at a minimum . . . less lumber is needed . . . and since removable steelforms can be used over and over again, only a nominal rental fee is charged.

Saves material because only a minimum of critically short steel is needed—and even here less concrete is necessary than required by other concrete floor constructions.

Ceco originated the removable steelform method of concrete joist construction. The company is first in the field—actually providing more services than all competitors combined. So, when concrete joist construction fits the need, call on Ceco . . . the leader over all.

HOSPITALS—Ceco Concrete Floor Joist Construction is ideally suited to hospitals since it provides fire-safe, sound-proof buildings at economical cost. Widely used in Veterans Hospitals.



CONCRETE JOISTS eliminate much of the concrete below the neutral axis, saving money, saving material. Suited to buildings with long spans: stores, offices, apartments, hotels.

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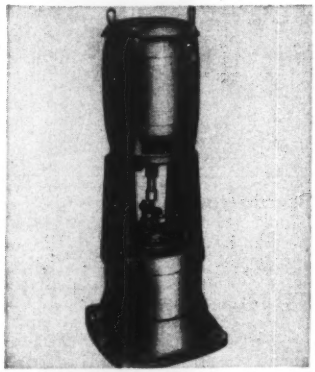
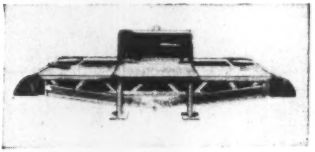
effective answer to the problem of root removal from sewers and sanitary drain systems. Hercules R-D requires no digging, mixing, stirring, or other method of preparation, as it is applied directly into the sewer. The crystals are not dissipated by the sewage, and, when absorbed by the root, cause complete disintegration. Toxic action is confined to roots in the sewer and does not reach the plants themselves. Two pounds of R-D is sufficient for an average dose.—Hercules Chemical Co., 332 Canal St., New York, N. Y.



High-pressure pump

Multi-stage high-pressure centrifugal pump requires minimum floor space due to vertical construction. Fig. 6606 pumps are furnished in 2, 3, 4, and 5-stage construction with 1¼-in. suction and 1-in. discharge openings. Pump and motor are built together as one unit. Motor has standard Type C mounting flange. Capacities range from 10 to 45 gpm against heads to 400 ft with 2, 3, and 5-hp motors operating at 3,500 rpm.—The Deming Co., Salem, Ohio.

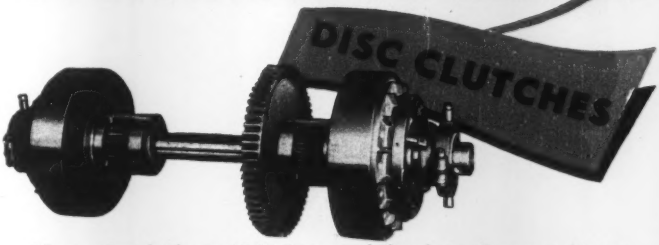


Portable truck scale

Thurman scale is dismantled for moving by removing the 6 nuts that hold the side arms in place. Remainder of the scale is then easily lifted as a unit. Extra-large steel bases support each scale, and no pits or concrete footings are required. The scale can be loaded with a light crane or winch. Special front-end loading

(Continued on next page)

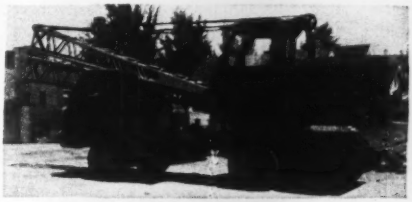
1 of 10 Reasons Why UNIT is a Better Machine



All operating clutches on UNIT Cranes and Shovels are disc-type and completely interchangeable — a very desirable feature when replacements are necessary. Engaging pressure is uniformly distributed over the entire frictional surface. Engaging surfaces are flat and polished for greater endurance, longer life, and better performance. Loads are picked up smoothly and evenly, without any tendency to grab or self-energize. Clutches are mounted on the high-speed countershafts, instead of directly to the drum shafts. This feature lends itself to a more compact design, smoother operation, maximum power, and greater accessibility for making adjustments or repairs. This method of clutch installation is another example of the superior design that is a part of every UNIT crane or excavator.

UNIT 1014 Truck Crane

The newly designed Unit 1014 Truck Crane is packed with quality and ready to prove it. Perfectly balanced, it has modern hook-roller construction. A separate engine powers the upper structure, and can be either gasoline or Diesel. The truck engine supplies power in a straight-line, through drive to the tandem rear axles.



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3 CUBIC YARD MIXER
GUARANTEED TO HOLD MIX AND AGITATE ITS RATED CAPACITIES AND CERTIFIED TO COMPLY WITH TRUCK MIXER MANUFACTURERS BUREAU STANDARDS AS APPROVED BY N.R.M.C.A.
4 CUBIC YARD AGITATOR
N.R.M.C.A. REGISTRY No.

00,000,000 plus

The Bureau rating plate is available to all manufacturers who meet its quality standards and requirements.

This truck mixer rating plate is what enables architects, engineers and contractors to confidently buy more than $300,000,000 worth of ready-mixed concrete a year.

It guarantees at a glance the proper drum design and speed, accuracy of water control *and full amount of free mixing space* needed to properly mix or agitate a rated batch.

Always look for this rating plate in order to avoid questionable concrete from non-standard truck mixers.

Truck Mixer Manufacturers Bureau

BLAW-KNOX DIVISION, Pittsburgh, Pa.
CHAIN BELT COMPANY, Milwaukee, Wis.
CONCRETE TRANSPORT MIXER CO., St. Louis, Mo.
THE JAEGER MACHINE COMPANY, Columbus, Ohio
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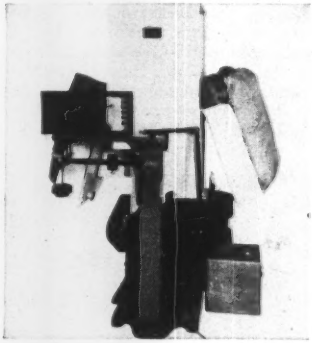
Hayward Buckets

Use this Class "E" Clam Shell Bucket for handling crushed stone, gravel, sand and other bulk materials.

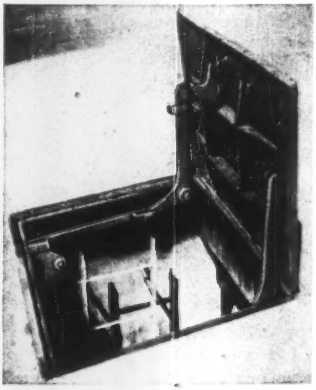
THE HAYWARD CO., 48-50 Church St., N. Y.

eyes are provided for winch loading. Standard capacities are: 18, 20, and 30 tons, with deck lengths from 18 to 30 ft. Special sizes are available to order.—THE THURMAN MACHINE CO., 156 N. 5TH, COLUMBUS, OHIO.



Fluoridizer

Model 47-A fluoridizer for feeding fluorides to water supplies features large hopper capacity, dustless filling, and low filling height. It holds two 100-lb bags of fluoride or one 125-lb drum carton. Dust production is eliminated by preventing fall of chemical through the air. Chemical is added at the bottom of the hopper, bag is placed on the hopper door, skewered in place, slit open at the top, and the door swung up and closed allowing the chemical to fall but a short distance into the hopper.—OMEGA MACHINE CO., 345 HARRIS AVE., PROVIDENCE 1, R. I.



Manhole covers

Counterbalanced cover is easily opened, and will hold in an upright position. It can be opened from the inside of the vault by one man as an added safety feature. Tamper-proof

(*Continued on page 115*)

HERE'S WHAT WE PUT *INTO* A ROCK DRILL ...SO YOU CAN GET MORE *OUT* OF IT!

Combination Backhead for blast rod, air tube or water tube operation greatly reduces cost of change-over parts. Air-operated automatic water valve is optional on same backhead.

Jet Valve is instantaneous, positive-acting, end-seating. Thrown by a jet of air, it provides precise timing. Increased piston hammer velocity results in high drilling speed, low air consumption, strong rotation and easy holding.

Integral Cylinder. All hammer bores are ground in line at one operation, allowing piston hammer to run in true alignment. Replaceable bronze cylinder bushing maintains the front cushion.

Resilient Retainer. Yoke-type, held in replaceable hardened steel bushings and spring-cushioned to dampen vibrations when pulling drill rods. Easily opened and closed, can't wear the chuck housing, and has positive lock-on nuts.

Four-Pawl Rotation. Four reversible pawls give maximum service at four rotation speeds — extra fast, fast, slow, extra slow.

Independent Blow Control changes from drill to blow with ease. Full line pressure available for emergency blowing. Large diameter air tube assures strong, constant blow. Side outlet exhaust is possible with optional blow valve.

Three-Piece Chuck. Chuck, sleeve and nut. Replaceable bronze chuck nut held in a steel sleeve checks piston flute wear.

Worthington BLUE BRUTES *Have Everything You Need For Hard, Fast, Money-Saving Drilling*

With every detail designed to make air do more work, Blue Brute Rock Drills combine the ruggedest construction with the easy handling that goes over big with operators. The WS-55, illustrated, is right for average jobs. For lighter work, use the WS-45 — for heavy duty, the WS-30.

3 More Reasons Why There's More Worth In A Blue Brute!

WB-34 Paving Breaker
Hardest-hitting, easiest handling breaker in the 35-lb. class. Ideal where the operator has to lift the tool frequently in guiding its work.

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Developed in the field by men with practical experience in clay, and thoroughly proved by long, rigorous job-testing.

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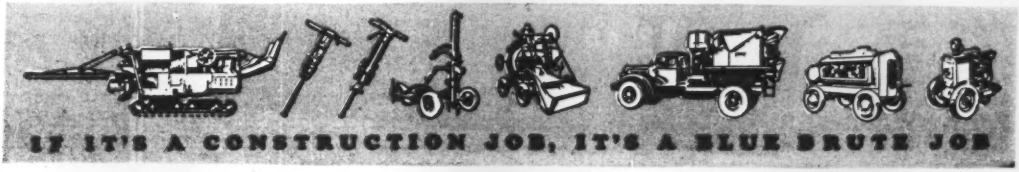

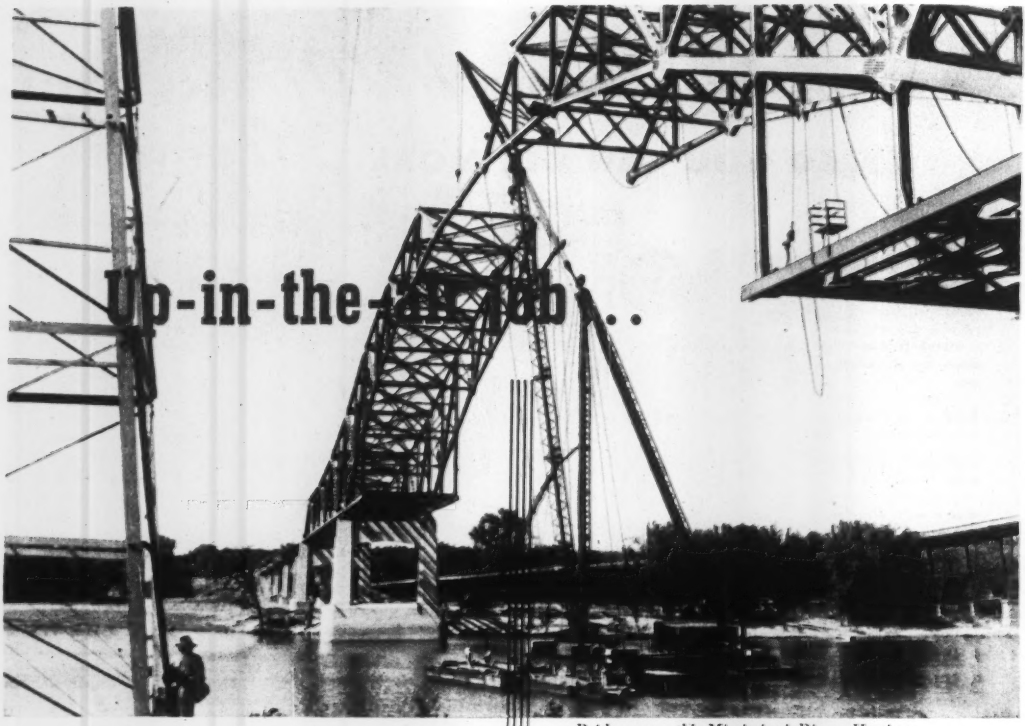

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built by down-to-earth methods

saves you money, saves you time!

The bridge you see here in the course of construction is over the mighty Mississippi River at Hastings, Minnesota.

Have you noticed what's different about the erecting technique? Sure you have . . . it's the speedy water-level method of raising and joining the members, instead of the usual slow inching of erecting derricks over newly laid sections at the bridge floor level.

Exclusive construction innovations, with modern fabricating short cuts which can be carried on simultaneously in 3 plants operating as a huge manufacturing unit, combine to save you time and money.

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Fabricators and erectors of structural steel for highway and railroad bridges; Industrial, office, school, and government buildings; Airport structures; Harbor facilities.

lock opens only when the combination key-handle is used. The cover provides an unobstructed 30-in. square opening—THE E. H. WACHS CO., 1525 N. DAYTON ST., CHICAGO 22, ILL.

Copies in 1 minute

Desk-top copymaker for use with the Polaroid Land camera turns out dry, finished copies of documents, sketches, drawings or photographs in 60 sec after the camera shutter is snapped. It handles objects measuring up to 11x14 in. Finished pictures are 3¼x4¼ in. The process requires no tanks or liquids—copy comes out of the camera dry and ready for use. Built-in timer on the side of the case shows when the necessary time has elapsed. Double polarization of the light—at the source and at the camera lens—eliminates all trace of shine or reflection.—POLAROID CORP., CAMBRIDGE 39, MASS.

New Product Briefs

Lettering guide is a 6-in. 45-deg triangle perforated to draw accurate guide lines of six different heights. It can also be used for cross-hatching. Other sizes, styles, and angles are available. Made by: Braddock Instrument Co., Swissvale, Pa.

Washer for sheet-metal roofing, siding, ductwork, etc, is made of metal and neoprene composition. Fabricated Products Co., West Newton, Pa., now has available a demonstration-test kit for sending to persons requesting it on company letterhead.

Angle saw guide for band saws increases capacity for cutting materials that are longer than throat capacity by twisting the saw band. Made by: DoALL Co., Des Plaines, Ill.

WELLMAN
easy handling of large stones

• Those big stones won't slip from the Wellman Stone Grab. Four-part closing cable reeving develops tremendous closing force on stones. Model shown has 5-ton capacity, 4½ foot jaw spread. Other capacities available.

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MANUFACTURERS' PUBLICATIONS

Clamshell buckets—Bulletin contains 42 pages of practical and useful information on maintenance and care of clamshell buckets. Included are suggestions on proper use and a list of common abuses to be avoided. A special section covers bucket lips—what makes them bend in or out; how to straighten distorted lips; and instructions for repairing fractures; hard-surfacing cutting edges; and rebuilding worn cutting edges. Reeve instructions and practical tips on prolonging cable life are included, as are diagrammed instructions for replacement of component parts.—Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh 22, Pa.

Protective coatings—Neolac 600 high-gloss resin enamel with high weatherability for wood, metal, and concrete is described in Bulletin 239. Features of this enamel, its chemical composition and physical properties, and methods of application are all discussed in detail.—The U. S. Stoneware Co., Akron 9, Ohio.

Diesel-engine maintenance—Protective maintenance for diesel engines is outlined in a new service bulletin. This bulletin discusses the purposes and advantages of protective-maintenance; tells how to determine the maintenance schedule; and lists five reasons to show how a maintenance program reduces operating expense. A typical maintenance-schedule sheet is shown on the last page of the bulletin.—Cummins Engine Co., Inc., Columbus, Ind.

Steel casement windows—Folder describes outside-inside metal-trimmed casement windows. Specifications and construction features of these casements, and a detailed description of types and sizes, are listed. Covered also are installation accessories. Instructions and sketches are included showing how to install the casement window in frame, brick veneer, or concrete-block construction.—Detroit Steel Products Co., 3159 Griffin St., Detroit 11, Mich.

Water-treatment unit—Self-contained unit for removal of hardness, turbidity, color, and algae from water supplies is described in Bulletin 9041. Described in detail is the up-flow (sludge-blanket) principle on which the Dorrco Hydro-Treator operates. The bulletin contains photographs,

drawings, and complete descriptions of the various types of Hydro Treators available and specific information on operating results, capacity ratings, and chemical dosing requirements. Also included are a complete set of suggested specifications and four pages of tables and formulas commonly used by engineers engaged in the solution of water-treatment problems. — THE DORR CO., INC., BARRY PLACE, STAMFORD, CONN.

Solvent cleaning compound—Booklet describes machinery cleaning, rust-inhibiting, and removal of rust-preventive coatings. The booklet features a 2-p leaflet on general applications of Actusol, as emulsifiable solvent-cleaning compound.—THE DUBOIS CO., 1120 W. FRONT, CINCINNATI 3, OHIO.

Automatic respirator—Bulletin CH-2 (4 pp) describes the M-S-A Pneolator —an instrument that makes possible automatic artificial respiration without suction. The bulletin explains the operation of the Pneloator in detail, and tells how it serves as an inhalator after voluntary breathing starts. — MINE SAFETY APPLIANCES CO., BRADDOCK, THOMAS & MEADE STS., PITTSBURGH 8, PA.

Materials-handling equipment – Meco equipment listed in this catalog includes: Hand trucks, platform trucks, barrel trucks, skids, dollies, and a complete line of rubber-tired and semi-steel wheels. It lists specifications and recommendations for selecting the best truck for a particular job.—MODERN EQUIPMENT CO., INC., 2011 CUMING, OMAHA, NEBR.

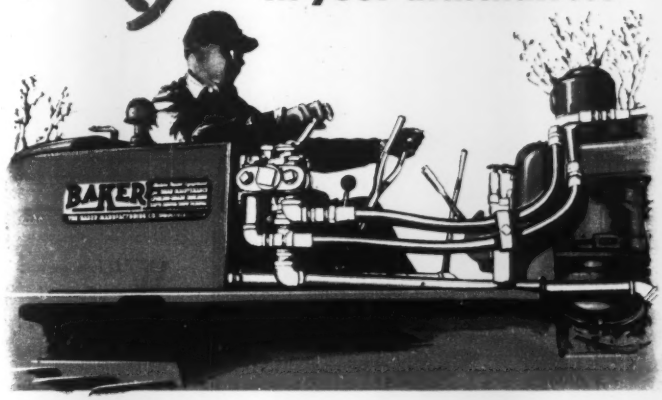
Hydraulic controls – Bulletins published by Monarch describe a complete line of hydraulic controls including controls for attachments mounted on Willys Jeeps; the Hy Lo-Jack control for snow plows and truck and tractor equipment; the Dyna-Might electric power hydraulic controls; and the Hy-Lo-Jack hydraulic power unit. Separate bulletins are available for each of these items.—MONARCH ROAD MACHINERY CO., 322 N. FRONT AVE., GRAND RAPIDS 4, MICH.

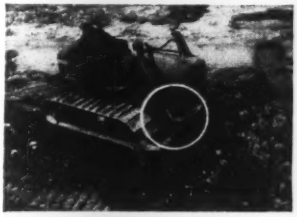
Motortruck operation—The Bureau of Public Roads has published "A Factual Discussion of Motortruck Operation, Regulation, and Taxation". This 113-p bulletin presents in summary form the records and other data available to the Bureau. Subjects covered include: Growth in registration and use; effects on design and capacity of highways; effects of axle loading;

(*Continued on page 119*)

Doze

in your armchair...





Direct lift and positive down-pressure are two of many features of the engine-mounted twin cylinder design in the new Baker blades for HD-5, HD-9, HD-15 or HD-20.

The design of the mounting brackets on either side of the engine frame makes your tractor engine easily accessible for inspection and adjustment.

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The operator can control the blade with his forearm resting on the seat arm. The control valve is equipped with ball bearings—needs only *finger-tip* effort to shift. And due to the exclusive BAKER valve system, you can count on your blade to *hold* in any position.

For the complete story on how BAKER blades can help you do more work and better work on every shift, see your Baker, Allis-Chalmers Dealer or write direct for Bulletin 894. THE BAKER MANUFACTURING COMPANY, Springfield, Illinois.

P.S.: Baker is the PIONEER and the SPECIALIST in bulldozers

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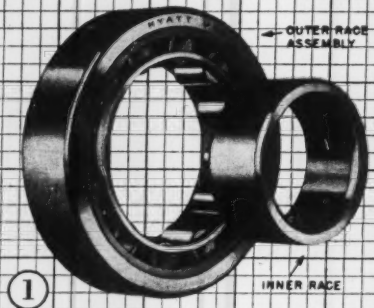

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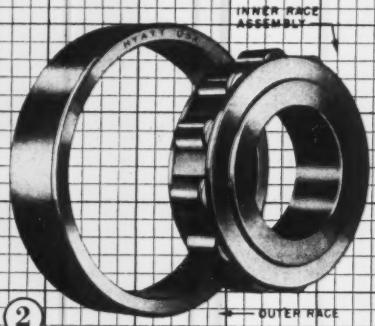

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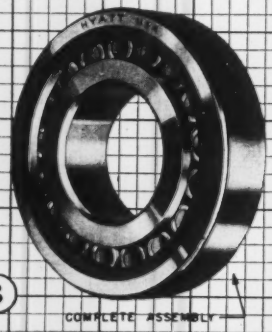

3

WHEN you are faced with the problem of providing the largest possible shaft diameter for a given bearing or the smallest possible housing, reach for a Hyatt catalog.

1 If design requirements are such that a larger shaft diameter is desirable to produce greater rigidity without disturbing boundary dimensions, a separable inner race type Hyatt Hy-Load bearing can be used with the inner race omitted. The rollers then operate directly on a suitably hardened and ground shaft.

2 When the housing bore must be kept to a minimum, a separable outer race bearing can be used with the outer race omitted. The rollers then operate directly in a housing bore of suitable hardness and finish.

3 If the design requires that the bearing be installed as a unit Hyatt also provides non-separable types of Hy-Load bearings.

All three types of Hyatt Hy-Load Bearings are available in a wide variety of cage, race flange and snap ring arrangements and in a wide range of sizes. For a complete explanation, write for our catalog No. 547. Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

HYATT ROLLER BEARINGS

weight and its effect on bridges; highway-user tax payments in relation to highway revenues and expenditures; and allocation of highway tax responsibility. Price of the bulletin is 30¢. —Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

Lift-truck attachments—Special engineering folder (4 pp) illustrates the many devices designed to grip, clamp, grab, or support almost any type of load. These attachments for use on fork-lift trucks can be used to load, lift, transport, unload, deposit, dump, upend, or revolve many types of products. The folder pictures and explains the purpose of each device.—Towmotor Corp., 1226 E. 152nd St., Cleveland 10, Ohio.

Mastic applications—Mastic caulking and pointing in masonry construction is described in this 12-p brochure. Illustrated by photographs and drawings, the bulletin contains a complete discussion of the subject. The specifications, indexed for handy reference, cover caulking, pointing, bedding, and buttering.—The Tremco Mfg. Co., 8701 Kinsman Road, Cleveland, Ohio.

Wellpoint systems—Descriptive literature on wellpoint systems features a description and specifications on the Model 646 4-in. Hi-Capacity portable pump. The bulletin illustrates and describes component parts, listing the advantages claimed for the design of each. Typical wellpoint applications are described—Foundation Equipment Corp., 38th Ave. & 10th St., Long Island City 1, N. Y.

Hydraulic hoists—Service manual for hydraulic hoists features the use of pictures and brief text to get the information over faster and clearer. This pocket-size manual contains an insert that opens up to 17x24 in. It covers all phases of hoist maintenance and repair, and lists do's and don'ts for most efficient hoist operation. —Galion Allsteel Body Co., Galion, Ohio.

Open-steel gratings—Technical manual describes properties of a line of structural steel footwalks, power-forged and riveted open-steel gratings and treads, Hexteel heavy-duty surface armor, and Ganister lining reinforcement meshes, Floorsteel flexible floor armor, open steel and aluminum bridge decking, and Flexteel flexible open-steel conveyor belt.—William F. Klemp Co., 6601 S. Melvina Ave., Chicago 38, Ill.

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A Philadelphia Story

Philadelphia, Pa., has embarked on a vast program of public improvements. For the 1951-56 period the City Planning Commission has outlined and approved public works projects to cost a total of $526,961,500. This is more than double the $237,000,000 placed under contract from 1945 through 1950.

Perhaps some $92,911,100 worth of the program is to be undertaken this year. However, the threat of material and labor shortages, and the need for a huge defense effort has city officials concerned lest these might force postponement of major phases of the work.

In addition, in some quarters there is doubt about the wisdom of the city's stretching its loan powers to the limit in financing such a huge program of public works at this time.

According to the tentative plan, the cost of the 5-year program would be financed in part by $306,087,000 from federal, state and township sources. Another $64,170,800 is available from loans already authorized. The remainder would come from new loans, $89,788,700; loans for self-supporting projects, $49,191,900, and current income and special assessments, $17,723,100.

The following public works are considered of prime importance in the city's second 5-year postwar improvement program.

• **Highways**—The Pennsylvania Highway Planning Commission has forecast expenditure of $1,726,000,000 over a 12-year period to eliminate existing bottlenecks and to accommodate the estimated 34 percent increase in motor vehicle traffic. The City Planning Commission listed the $80,000,000 Schuylkill Expressway as the most important immediate project. Other major ones under way or scheduled for the near future are: Extension of the Delaware Industrial Highway; construction of the Levick Street underpass; completion of the Penrose Avenue bridge; widening of Vine Street, and creation of the Pennsylvania Boulevard on the site of the present "Chinese Wall"—the old Pennsylvania R. R. approach to the Broad Street Station.

The Delaware River Joint Commission will decide whether to build another bridge or construct the first tunnel between Philadelphia and a New Jersey location across the Delaware River.

• **Housing**—The Philadelphia Zoning Board of Adjustment has approved two sites for 920 housing units. Other projects had been approved earlier. The Philadelphia Housing Authority has been allocated $100,000,000 in federal funds for the construction of 10,000 dwelling units, with future allocations to double that figure. Total expenditures for public housing during the next six years have been set at $222,000,000.

• **Water**—Several millions of dollars will be spent during the year on the city's own 6-year water treatment program which will cost $40,856,000. Construction conditions and maximum financing plans will determine the final amount to be spent. Principal items are $6,050,000 for universal metering, $9,000,000 for water main extension, $9,045,000 for the Torresdale plant, $4,300,000 for slow sand filters at the same location.

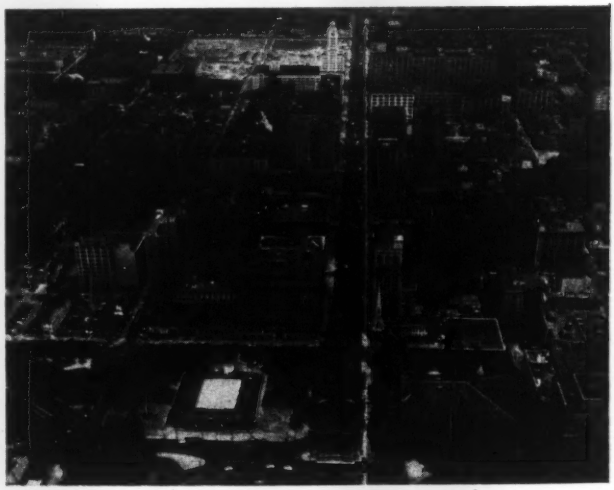
• **Transit**—Philadelphia will spend $13,850,000 within the next two years on the improvement of its transit system. The largest single item —$6,850,000—has been earmarked for the Market Street subway extension; providing for operating equipment in the new subway section from 20th to 46th streets, and for removal of the present elevated structure in the same area. The other funds include $6,000,000 for the extension of subway-surface car service from the present 36th and Ludlow Streets cutoff to a point near 40th Street and Woodland Avenue.

• **Hospitals**—The city has scheduled $6,036,300 for improvements for the Department of Health at the Philadelphia General Hospital and the Hospital for Contagious Diseases.

• **Sewerage**—Several millions of dollars will be spent on one of the city's major projects—improved collection and treatment of sewage. The program was allocated $26,948,900 in the 6-year program. With the Northeast sewage treatment plant virtually complete, the city also proposes expenditure of $28,500,000 for sewer construction and drainage improvement throughout the city.

• **Flood relief**—Last December the city let a $1,950,000 contract for flood relief work. It calls for construction of about a mile and a half of pipe. Other flood relief contracts will follow in a 6-year program calling for expenditures of $12,150,000, of which $4,810,000 will be for the major Frankford Creek projects.

The Pennsylvania Railroad allotted $6,500,000 for its central-city projects. The Board of Education has a multi-million dollar construction program, and the Zoning Board has approved creation of two new industrial areas in the Northeast section of the city.



WILLIAM PENN, atop the Philadelphia City Hall, views the results of his wise city planning of 1682. He never contemplated spending $526,961,500.

Raymond

MAKES 5 TYPES OF CONCRETE PILES

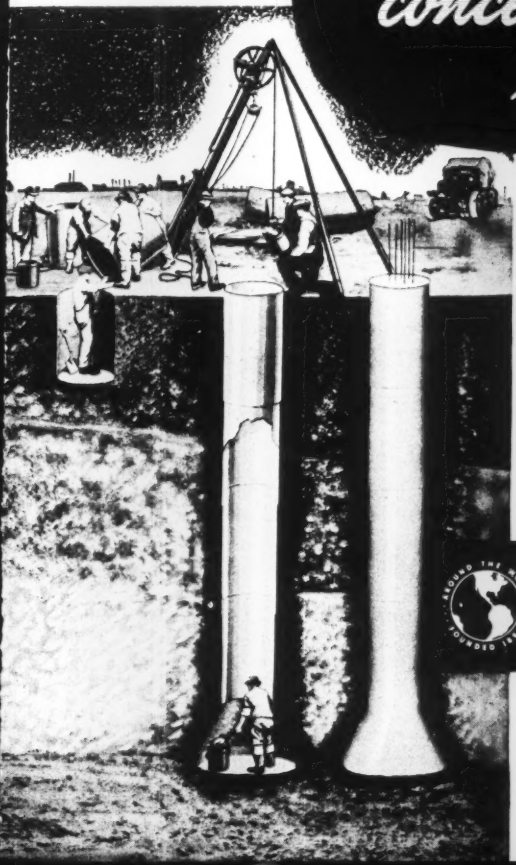
1. STANDARD . . . 2. STEP-TAPER . . . 3. PIPE STEP-TAPER
4. COMPOSITE . . . 5. GOW CAISSONS

Raymond installs every type of pile: cast-in-place concrete, precast concrete, steel pipe, wood and H-beam. Raymond operations include underpinning; borings and soil investigations; waterfront construction and harbor and river improvements; and cement mortar lining of oil and water pipe lines 4" to 144" in diameter by the Centriline Corporation, a Raymond subsidiary.

At left, excavating starting pit and placing first cylinder. At center, excavating bell at bottom of the steel-lined shaft. At right, the completed caisson.

5. GOW CAISSON PILES

For heavy concentrated loads . . .



Raymond Gow caissons are efficient and economical for supporting heavy concentrated loads under certain soil conditions. The Gow method consists of hand or machine excavation carried on inside of telescoping steel cylinders. Where the caisson rests on hard ground, a bell is usually formed at the bottom to distribute the load over a large area. Where the caisson rests on rock, the bell is usually omitted. After excavation is completed, the steel cylinders are removed as the concrete is poured.

Because heavy equipment is not required and the steel cylinders are re-usable, Gow Caissons are economical in most soils. Your inquiry is cordially invited.

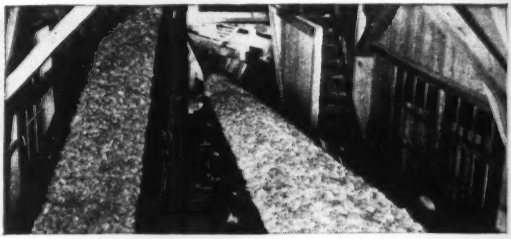
Raymond CONCRETE PILE CO.

140 CEDAR ST., NEW YORK 6, N. Y.

BRANCH OFFICES: Boston, Syracuse, Philadelphia, Baltimore, Washington, Pittsburgh, Atlanta, Miami, Houston, Kansas City, St. Louis, Cleveland, Chicago, Detroit, Salt Lake City, Portland, San Francisco, Oakland, Los Angeles and principal cities in Latin America.

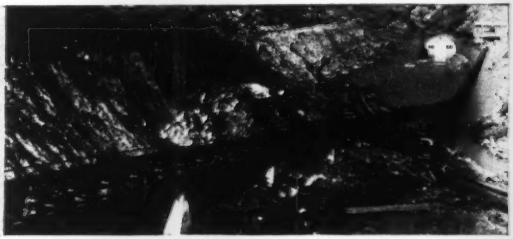
On heavy-duty conveyors . . .

IT'S TIMKEN®...



These 23" and 30" Rex conveyors built by Chain Belt Company have been in service more than 10 years. Idlers use Timken bearings.

AND TIMKEN



Four-belt, limestone-carrying conveyor system built by Barber-Greene is 3,795 feet long, uses 8,566 Timken bearings.

AND TIMKEN AGAIN!

This Stephens-Adamson conveyor system on Timken bearings handles up to 1,000 tons of rock per hour.

—FOR 6 BIG REASONS!

1. THOROUGHLY PROVED. Timken® is the only tapered roller bearing proved by 15 years or more of service in heavy duty conveyor installations using the popular dead shaft construction.

2. EXTRA CAPACITY. Line contact between rollers and races gives Timken bearings high load capacity. And by using Timken bearing sizes that are mass produced for the automotive industry you get extra capacity bearings that actually cost *less* than the smaller sizes you'd normally use.

3. LONG-LIFE LUBRICATION. Not just lubricated for "life" but lubricated periodically as conditions require to insure *long* life. Fresh lubricant at regular intervals ends gummy, sticky, jammed bearings.

4. FRICTION MINIMIZED. Timken bearings' true rolling motion and extremely smooth surface finish practically eliminate friction.

5. LONGER ROLLER AND BELT LIFE. Less sliding and scuffing between idlers and belt.

6. MAINTENANCE REDUCED. Long life and dependable performance of Timken tapered roller bearings cut maintenance to a minimum.

Remember "Timken" is not a bearing type. It is a trademark applying only to bearings made by The Timken Roller Bearing Company. Always use Timken bearings in your conveyors. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

Wherever the going's tough industry turns to

TIMKEN

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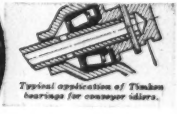
TAPERED ROLLER BEARINGS



Typical application of Timken bearings for conveyor idlers.

NOT JUST A BALL ○ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ◎ AND THRUST →◎← LOADS OR ANY COMBINATION ✳